

COMPETITIVE INTERFERENCE AND CONSUMER MEMORY
FOR MAGAZINE ADVERTISING

BY

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A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

1985

ACKNOWLEDGMENTS

I wish to express my sincere appreciation to the individuals who served on my dissertation committee: Richard Griggs (chairman), Joel B. Cohen, Ira Fischler, John Lynch, and Pat Miller (all of the University of Florida). Together, they made a tremendous contribution to my graduate education and provided the guidance, encouragement, and patience that enabled me to complete this project. I also gratefully acknowledge the help of Thomas K. Srull (University of Illinois) who gave me the initial inspiration to work in this area and continues to be a source of knowledge and advice.

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Requirements for the Degree of Doctor of Philosophy

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May 1985

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Of the estimated 300 to 600 advertisements the average consumer is exposed to in a single day, only a small fraction are recallable shortly thereafter. Yet, advertisers have not conducted research to determine whether ads seen in the past interfere with each other in consumer memory, whether interference is the main cause of forgetting of advertised information, or possible means for overcoming interference-induced forgetting.

In the dissertation research, the advertising forgetting process was first reviewed from both a marketing and a psychological perspective, and then examined in three experimental investigations employing modified retroactive and proactive inhibition paradigms. All studies were conducted in a laboratory setting using a computer controlled, ad-exposure procedure. Three general hypotheses motivated this research: (1) increased competitive

advertising was predicted to decrease the memorability of the unique characteristics of advertised brands, (2) this inhibition effect was expected to be moderated by the processing objectives of the consumer at the time of advertising exposure, and (3) the level of competitive advertising was predicted to interact with the frequency of ad exposure to determine memory response.

Results of the three studies were generally consistent with predictions. The first two experiments revealed that the recallability of distinctive product information conveyed in a manufacturer's advertisements is significantly inhibited by competitors' advertising, and by that manufacturer's ads for other products in the product line. They also suggest that if the consumer anticipates purchasing the product, he/she may encode the advertised information in a manner that makes it resistant to interference-induced forgetting.

The third study indicated that the level of competitive advertising can have a significant influence on the shape of the memory response curve. Repetition (1, 2, or 3 ad exposures) was found to have the greatest positive effect on recall when there was no advertising for similar products. This factor had no significant effect on target ad recall when the ad appeared in the context of two or three ads for competing brands. This suggests that there is an initial threshold in the memory response curve in media environments characterized by heavy levels of competitive advertising.

INTRODUCTION

Advertising productivity is critical to the success of many consumer products. Recently, advertisers have expressed concern that this productivity may be compromised by the tremendous amount of mass-media advertising (Schultz, 1979). The average consumer is exposed to between 300 and 600 advertisements a day (Adams, 1965; Britt, Adams, & Miller, 1972), and is found to be able to recall only a fraction of these ads (Hume, 1983; Weilbacher, 1979). It is therefore suprising that, while advertising researchers have done considerable research on the factors influencing a consumer's ability to remember advertising (e.g., ad layout, size, and color; Valiente, 1973), they have not looked directly at whether advertisements interfere with each other in consumers' memory, whether interference is the main cause of forgetting of advertised information, or at possible means for overcoming interference-induced forgetting (Sawyer, 1974). Although a few researchers have suggested that the high rate of forgetting of ads could be due to an interference process (Bagozzi & Silk, 1983; Bettman, 1979; Britt, 1978; Percy & Rossiter, 1980), most either present no theoretical account of the forgetting process, or describe

it as a simple time-dependent decay function (Gensch, 1973; Ward, 1976; Zielske & Henry, 1980).

The possibility of advertising interference has significant implications for a number of key advertising strategy decisions: (1) choosing a creative approach for an ad campaign relative to competitors' approaches; (2) setting schedules of ad repetition in various competitive environments; and (3) deciding on campaign strategies in the multibrand company, among others. Inter-advertisement interference is also relevant to several hotly debated public policy issues. Most notable is the question of whether one, or a small group of companies in a market can create a barrier against potential entrants through heavy advertising (Comanor & Wilson, 1974).

In this paper, the forgetting process will be discussed from both a marketing and a psychological perspective. Then, the results of three experimental investigations of interference in consumer memory for advertising will be described. The following hypotheses underlie this research: (1) increased competitive advertising will decrease the memorability of the unique characteristics of advertised brands, (2) this inhibition effect will be moderated by the processing objectives of the consumer at the time of advertising exposure, and (3) the level of competitive advertising will interact with the frequency of ad exposure to determine memory response.

MARKETING PERSPECTIVES ON FORGETTING

Although day-after-recall is one of the most popular commercial measures of advertising effectiveness (Coe & MacLachlan, 1980), and considerable effort has been invested to determine how the characteristics of ads influence advertisement memorability (e.g., MacLachlan, 1983; Valiente, 1973), marketers have shown little interest in the nature of the advertising forgetting process. Much more theoretical attention has been given to such variables as product beliefs, attitudes, and purchase intentions; presumably because they are more closely linked to choice behavior than is product awareness. In fact, some researchers (e.g., Gibson, 1983; Plummer, 1972) have argued that ad recall is largely irrelevant to advertising effectiveness. Gibson (1983) suggests that the commercial popularity of recall measures is mainly due to the ease with which recall can be measured, the availability of standards for comparing recall performance, and habit.

In this section, the relationship between memory and advertising effectiveness is discussed and various marketing perspectives on the forgetting process are reviewed.

Memory and Advertising Effectiveness

There are a number of reasons for arguing that the generation of product awareness and knowledge (assessed through recall measures) is a critical component of effective advertising, and that research attention should focus on the forgetting process. These include implications from advertising theory, results of empirical research, and changing characteristics of the media environment.

The "hierarchy-of-effects." Available theories of how advertising works suggest that some form of product knowledge, or factual learning, is a necessary step in the communication and persuasion process. Consumers will not prefer and purchase products unless they are somewhat familiar with them. As Haskins (1964) notes,

Such theories postulate a certain sequence of psychological effects that must be induced for advertising to be successful, a scalable series of necessary conditions. One such model (Association of National Advertisers) lists awareness, comprehension, conviction, and action as necessary steps. . . . The "innovation theory" model, which describes how new ideas and practices are diffused, postulates a five-step sequence: awareness, interest (and information-seeking), evaluation, trial, and adoption. . . . Then there is the familiar AIDA--attention, interest, desire, and action. [p.2]

Unfortunately, these "hierarchy-of-effects" models have not gone beyond a simple description of stages to specify

how consumers move from one stage to the next (Aaker & Myers, 1982). Models have been developed to relate product beliefs, preferences, and purchase intentions to product trial (e.g., Green & Srinivasan, 1978; Roy & Nicolich, 1980; Wilkie & Pessemier, 1973), but a theory of how to achieve and maintain brand awareness and knowledge is lacking.

Empirical research. From the analysis above, one would expect that advertising effectiveness would depend on a number of factors, including the needs of the target market, the memorability and persuasiveness of the advertising, and product availability. Therefore, research should reveal some degree of relationship between each of these variables and product sales. Empirical evidence indicates that ad recall is positively related to purchase behavior. While early research showed a very small association between recall and sales (Bogart, Tolley, & Orenstein, 1970; Haskins, 1964), more recent investigations report moderate positive relationships (Lamar, 1981; Stout, 1980; Tele-Research, 1970).

A problem with comparing the results of the many studies investigating this relationship is that the measures of recall performance vary tremendously. Some researchers use brand awareness (e.g., "Considering [product class], please tell me all the brands you can think of"), ad awareness (e.g., "What brands have you seen or heard advertised for [product class] in the past three months?"),

ad playback (e.g., "What can you remember about the advertisement for [brand name]?), brand knowledge (e.g., "What can you remember about [brand name]?), and so on. In a study comparing a number of these measures, Axelrod (1968) reports that the recall measures vary widely in their ability to predict purchase behavior and brand switching. He concludes that brand awareness is the best predictor of short-term trends in purchase behavior.

One would also expect that the recall-to-sales relationship depends on the stage of the advertised product in the product life-cycle, and the nature of the product class. Achieving information recall is generally more important than persuasion or attitude change when a product is first introduced. Later in the product life-cycle when consumers are already familiar with the advertised brand, their ability to remember new ads will probably not have as much of an impact on their preferences. Recall is also a significant issue for "search" products, where advertising serves mainly to inform the consumer about the product's attributes, and differentiate the product from competitive brands. For frequently purchased packaged goods, recognition response might be more strongly related to preference than recall (Bettman, 1979). Another consideration is recall content. One would not expect recall to be related to sales when the memory is of negatively evaluated product or advertisement characteristics (Hodock, 1976). Haskins (1964, p.7) lists a number

of other factors that may moderate the relationship between factual learning and brand preference, including consumer personality, communication medium, source credibility, and number of available alternatives.

Environmental changes. Increasing amounts of mass-media advertising have made the task of generating product awareness more and more difficult (Ries & Trout, 1981). Estimates of the total number of advertisements to which the average American is exposed in a day vary from about 300 (Britt, Adams, & Miller, 1972) to 560 (Adams, 1965). This number will undoubtedly grow as the "split-30" commercial proliferates on network television (Gay, 1984).¹ The volume of advertising today seems to have a detrimental effect on consumers' abilities to remember advertising for any particular brand. Weilbacher (1979) notes, "The average day-after-recall score for 1,253 30-second commercials tested by Burke Marketing Research . . . in the 1970's was 24%. That means that 76% of the consumers who were exposed to the average test commercial could not recall any substantial part of it when asked to do so the next day" [p.14]. McMahan (1980), in a test of 1800 TV commercials aired on 29 nights, finds that less than one-third of those interviewed could remember and describe a commercial, only

1. The split-30 commercial allows a manufacturer to advertise two unrelated products during a 30 second spot. It is likely that this will eventually be followed by the stand-alone, 15-second unit.

16 percent could remember the name of the sponsor, and 8 percent misattributed the commercial to a competitor. Similarly, Hume (1983) reports that many consumers are unable to remember advertising for any of the brands in many product categories.

There have been some attempts to show a causal relationship between the volume of mass-media advertising and forgetting (Burke, 1972; Webb, 1979; Webb & Ray, 1979). In a series of laboratory studies on the effects of television clutter, Peter Webb and Mike Ray investigated how the media environment influences consumer "initial processing," i.e., the cognitive and perceptual processes at the time of advertisement exposure. They predicted that consumers will "tune out" uninvolved ads presented in a cluttered environment, and this lack of attention will lead to poor memory for product information. Their results give suggestive support to this hypothesis. While Webb (1979) reports no effect due to the manipulation of clutter, he finds that commercial attention and recall drop off with each successive ad exposure. Using a more extensive manipulation of clutter, Webb and Ray (1979) find significant effects of level of clutter on commercial attention and brand recall. In the upcoming discussion, it is argued that the similarity of advertisements in combination with the total volume of advertising determines forgetting rate.

From the review above, it is clear that memory for advertising is theoretically and empirically related to advertising effectiveness, and that the nature of the media environment makes the task of achieving product awareness very difficult. Memory, then, has become an important issue for advertisers. Attention now turns to the two popular conceptualizations of the forgetting process in the marketing literature: forgetting as a decay process and forgetting as a consequence of competitive interference.

Advertising Decay

From the observed correlation of forgetting with the passage of time, many people have been led to infer that memories fade because of the lapse of time. This line of reasoning was formalized by Thorndike (1914) in his "law of use." He argued that habits are strengthened through use and are weakened through disuse (i.e., the passage of time).²

This time-dependent decay notion has carried over into the marketing field, particularly in the modeling of consumer response to advertising. For example, Zielske and Henry (1980) model forgetting as a function of time, with

2. The process of forgetting-due-to-disuse has often been attributed to continual physiological changes in the brain (e.g, deterioration of brain cells).

the particular model presented suggesting that about 9% of the total people who could recall an ad in week t would have forgotten that ad by week $t+1$. Zielske and Henry found that "forgetting rates were fairly constant among the campaigns and products represented in the data base" [p.9]. They note,

The forgetting function assumed that a fixed percentage of the previous period's awareness level is lost each time period. This assumption is basic to the MEDIAC model [Little & Lodish, 1969] and is also assumed in much of the work on forgetting. [p.11]

The discussion of "decay" in advertising is often a discussion of the decay of an advertisement's effect on consumer behavior over time, rather than the fading of memory. Quantitative advertising/sales-response models typically have a "decay" parameter reflecting an advertisement's decreasing effect over time, or lagged factors representing an ad's effect at time $t+1$, $t+2$, etc. (e.g., Horsky, 1977; Nerlove & Arrow, 1962). This decay function represents not only the forgetting of advertising, but also the decreased persuasive influence of remembered advertising over time. Ostheimer's (1970) view of decay is typical:

It should be noted that thinking of decay solely in terms of "forgetting" is too narrow a concept. In the world of advertising, products continually vie with one another for share of mind, favorable opinion, etc., so that one brand's gain often is another brand's loss. [p.20]

There is often the implicit assumption that it is not time alone, but other unmodeled factors that cause the effect of

advertisements to dwindle. Yet, many models incorporate the decay parameter for the sake of simplicity.

Advertising Interference

A number of marketers have recognized that the high rate of forgetting of advertised information may not be due to the simple passage of time, but to an interference process. Bagozzi and Silk (1983), Percy and Rossiter (1980), Britt (1978), Bettman (1979), and others have suggested that memory for advertisements may be inhibited by the competition occurring between new and old pieces of information in memory. For example, John Maloney (1963) notes that ". . . the fading of belief can be attributed to 'overcrowding the active file space' in the reader, listener, or viewer's mind (known technically as retroactive inhibition)" [p.5].

However, there has been no published research in the marketing field investigating the nature of this interference, conditions where it may or may not occur, and steps advertisers can take to counteract the interference process. Alan Sawyer (1974) notes, "From learning studies, it is known that proactive and retroactive interference as well as time are important [factors in the forgetting of material]. However, these factors have never been dealt with in advertising even though the constant exposure of all

types of advertising would seem to offer many opportunities to interfere with learning of tested stimuli" [p.212].

In the next sections, attention turns to the extensive work in psychology on the nature of interference-induced forgetting, and the implications for advertising.

PSYCHOLOGICAL PERSPECTIVES ON FORGETTING

In the area of cognitive psychology, the forgetting process has received a tremendous amount of research attention. There is general agreement that most, if not all, forgetting of information from long-term memory is due to a retrieval interference process (Loftus & Loftus, 1980). Everything people learn is thought to be permanently stored in the mind. They forget information only because they have subsequently learned other similar information that interferes with their ability to find the appropriate memory traces during their search of memory. This view is consistent with some of the classical Interference Theory notions (McGeoch, 1942; Postman & Underwood, 1973), as well as many of the recent information processing models of memory (Anderson, 1983; Kintsch, 1974; Lewis, 1979; Lockhart, Craik, & Jacoby, 1976; Raaijmakers & Shiffrin, 1981; Thorndyke & Hayes-Roth, 1979; Watkins, 1979).

In the upcoming discussion, the evolution of the interference concept and accompanying empirical research will be briefly reviewed.

Interference Theory

Much of the work in psychology on the learning and forgetting of information followed from the interests of functionalists in the adaptive value of particular mental faculties (Hilgard & Bower, 1975). James Angell, John McGeoch, Arthur Melton, and others were interested in how an organism comes to satisfy needs by learning to associate particular responses with various situations, and how numerous factors influence the retention and transfer to new situations of these stimulus-response associations. Under the heading "Interference Theory," they conducted extensive research and proposed a number of ideas to explain their discovery that associations learned at one point in time can inhibit the remembrance of other associations learned either before or afterwards. As Crowder (1976) notes,

It is widely agreed that the large set of evolving propositions and principles known as Interference Theory is the most comprehensive theoretical system in the field of human learning and memory; the relevant objective analyses would probably show it to be one of the two or three most extensive theoretical efforts within all of experimental psychology. [p.217]

The paired-associates learning task. The experimental situation that best illustrates the concepts of Interference Theory is the paired-associates learning task. This task requires subjects to sequentially learn a number of lists of

word pairs, and then to recall items from one or more of the lists at a later time. It is frequently used in research on verbal learning and forgetting because it permits the separate and independent control of the stimulus similarity and response similarity of list items. Interference Theory also applies to many other tasks, but is easiest to explicate in the context of the paired-associates task.

The standard experiment on retroactive interference using the paired-associates task involves two groups of subjects. Both groups first learn to associate each word in a first set, arbitrarily labeled A, with a corresponding word in a second set, B. This can be represented as

$$(A - B) T_{AB} C_1.$$

That is, the elements of word set A are associated with those of word set B at time 1. The tag T_{AB} designates the particular list of word pairs (e.g., "List 1"), and C_1 indicates the context at time 1, which would include any salient environmental characteristics of the list learning situation (cf. McGeoch's, 1942, distinction between the nominal and functional stimulus).

The experimental group is then asked to learn to associate the old set of stimulus items, A, with a new set of response words, C. (These word pairs constitute "List 2.") The control group, on the other hand, performs a distractor task, such as solving arithmetic problems or learning to associate a new word set D with the response

set C (see Figure 1). Following a retention interval, usually filled with some task to minimize rehearsal, both groups of subjects are given a "modified free-recall" test: they are asked to recall the responses from the B word set, given the corresponding words from the A set and the list designation (T_{AB}) as cues. This A-B A-C design is shown in symbolic notation in Figure 2.

Context	Group		Task
	Experimental	Control	
C_1	List 1 a1 b1 a2 b2 : : an an		LEARN
C_2	List 2 a1 c1 a2 c2 : : an cn	List 2 d1 c1 d2 c2 : : dn cn	LEARN
C_3	List 1 a1 ?? a2 ?? : : an ??		RECALL

Figure 1: The retroactive interference paradigm.

Group	
Experimental	Control
(A - B) T _{AB} C ₁	(A - B) T _{AB} C ₁
(A - C) T _{AC} C ₂	(D - C) T _{DC} C ₂
(A - ?) T _{AB} C ₃	(A - ?) T _{AB} C ₃

Figure 2: The retroactive interference paradigm.

If the experimental group recalls fewer B items than does the control group, then retroactive inhibition (interference) is said to have occurred. This effect has been well documented (see reviews by Crowder, 1976; Postman & Underwood, 1973), and indicates that the memory for a stimulus-response association is inhibited by the subsequent learning of new responses to that same stimulus. For both groups, the same amount of time elapses between the learning of the A-B list and the recall test of B given A. Therefore, the recall differences between groups cannot be attributed to a time-dependent decay process.

The proactive interference paradigm was developed to examine how material learned on one occasion can affect the learning and remembrance of new material encountered on some later occasion. In this design, both the experimental and control groups learn to associate the words in a list of word pairs, A-B, and are later tested for recall of the elements of the B set, given the A set words as cues. The

experimental group, however, previously learns to associate the A set with another set of words, C, whereas the control group performs a distractor task before learning the critical A-B word pairs (such as learning a D-C list). The schematic representation of this design appears in Figure 3. Proactive interference is the observed decrement in recall of A-B by the prior learning of A-C (Underwood, 1957). Proactive effects are found to be minimal immediately after A-B learning, but increase over a retention interval (Ceraso & Henderson, 1966; Koppenaal, 1963).

Group	
Experimental	Control
(A - C) T_{AC} C_1	(D - C) T_{DC} C_1
(A - B) T_{AB} C_2	(A - B) T_{AB} C_2
(A - ?) T_{AB} C_3	(A - ?) T_{AB} C_3

Figure 3: The proactive interference paradigm.

Response competition and unlearning. John McGeoch (1932, 1942) introduced the notion of "response competition" to account for interference effects. He argued that the strength of an association is established by training, and is not influenced by the passage of time or new learning. According to McGeoch, in the paired-associates paradigm, the learning of a second list, A-C, does not weaken associations

between word pairs learned from a first list, A-B. Forgetting occurs because the two different responses, B and C, compete with one another for emission when the stimulus A is presented. The occurrence of overt intrusions (i.e., C list items mistakenly recalled during the recall test of the original list, A-B) was interpreted by McGeoch as direct evidence for response competition.

The second major concept to surface in the evolution of Interference Theory was the "unlearning hypothesis." Melton and Irwin (1940) rejected McGeoch's "independence hypothesis" in favor of the alternative view that learning of new material can weaken the traces left by the original material. They suggested that retroactive interference was due to two factors: the response competition process described by McGeoch, and the unlearning of original memory traces as a result of interpolated learning. From their point of view, when new responses to list items are being learned, old responses are not being reinforced, and are therefore "extinguished."¹

Melton and Irwin's "two-factor theory" was supplemented progressively by a number of additional principles:

1. If this behavioristic account of forgetting holds, then one would expect "spontaneous recovery" of extinguished responses. That is, if a response is extinguished, a period of time passes, and the conditioned stimulus is presented again, then the conditioned response should reoccur. The results of a number of studies support this prediction (Briggs, 1954; Underwood, 1948a, b).

1. Generalized response competition--there is a tendency on the part of the respondent to continue to give responses from the most recently learned list on the retention test for an earlier list (Newton and Wickens, 1956).
2. Response-set suppression/interference--remembrance of word pairs is influenced by a response selection mechanism which exerts an effect on an entire list of responses rather than specific stimulus-response associations (Postman, Stark, & Fraser, 1968). This is an extension of the concept of generalized response competition.
3. List differentiation--learning new responses does not reduce the accessibility of all of the old responses, but does weaken their ties to context cues that permit list discrimination (Keppel, 1968; McGovern, 1964).

The first two hypotheses, "generalized response competition" and "response-set suppression," attempt to explain the finding that "control group" subjects who first study an A-B list and then learn a D-C list exhibit extensive forgetting of the first list when compared with a different control group of subjects who learn A-B and then simply rest for an appropriate interval before the retention test. It appears that the learning of the "unrelated" D-C

list produces considerable retroactive interference (Newton & Wickens, 1956).

The list differentiation hypothesis suggests that a subject may have difficulty differentiating between recalled responses for a particular stimulus. For example, during A-C learning following a session of A-B learning, the subject may intrude the B response, although he/she knows both responses, because he/she confuses the two lists. Or the subject may remember but not vocalize the response C because he/she erroneously identifies it as coming from the first list. The process of list differentiation is dependent on the subject's ability to recall the context in which a stimulus-response association was learned.

Information Processing Models

In contrast to Interference Theory, information processing models assume that stimuli and responses can be internal and complex. The emphasis is on the concepts or schemata in memory activated by physical stimuli and responses, rather than the stimuli and responses themselves. The overlap in mental representations of information acquired over time is the primary determinant of interference. Bransford, McCarrell, Franks, & Nitsch (1977) illustrate this point:

A sentence like A Sparrow is like a rocket is accurately cued recalled under some list conditions. But if this sentence is embedded with others like A hawk is like an airplane, A robin is like a kite, etc., frequent mistakes and mispairings arise once again. . . . One way to view these problems of interference is to note that it is impossible to adequately predict remembering by considering only the local properties of individual "traces" of inputs. The global properties of a total set of experiences play an important role in determining subjects' abilities to adequately re-create previous events. [p.455]

Information processing models also differ from Interference Theory by addressing issues concerning the structure and organization of associations between concepts, and the effects of encoding and retrieval factors, such as the individual's information processing objective and multiple retrieval cues.

Although a large number of information processing models have been proposed, most can be classified as either associative network models or schema models. The predictions of each about the forgetting process will be discussed below.

Associative network models. Associative network models employ a different analogy from the ones discussed earlier to explain the forgetting process. Forgetting is neither like a fading canvas (unlearning) nor a blocked channel (response competition). Recall is modelled as a search process, and forgetting is like an unsuccessful hunt (Ceraso, 1967).

In most associative network models, memory cues make direct contact with corresponding representations in memory. After direct contact takes place, there is some form of search for associated information through a network of linkages (Loftus & Loftus, 1976). One hypothesis is that the search for stored information is a serial process (Anderson & Bower, 1973; Norman & Rumelhart, 1975). That is, the links from the mental representation of the memory cue are sequentially traversed in order to retrieve associated information. This serial search process is limited to the extent that individuals have "stopping rules" that tell them to give up the search after a certain period of time or amount of effort. The greater the number of competing links, the more likely it is that the link leading to the target information will not be searched.

An alternative hypothesis is that memory search is a parallel process (Anderson, 1976, 1983; Collins & Loftus, 1975). When a concept is activated by a memory cue, a limited amount of mental energy spreads out from the concept across links to associated nodes. When sufficient energy reaches a node, the information it represents is remembered. Because the total amount of energy released by a cued concept is limited, an increasing number of links decreases the retrieval likelihood of each individual piece of associated information.

Both the serial and parallel search models predict that information exists in memory that we cannot recall because

of retrieval failure. In support of this hypothesis is the fact that we can recognize many things that we cannot recall (Postman, 1952; Postman, Jenkins, & Postman, 1948). These models also allow for forgetting to be due to problems of discrimination between similar memories. Since retrieval of information is often a matter of matching available memories with particular contexts, "interference" can result from errors in decisions concerning the identification of potentially remembered information (Anderson & Bower, 1972, 1974; Tulving, 1972). This notion is similar to the list-differentiation hypothesis mentioned earlier.

Schema and script theories. In an effort to explain the effects of large, complex units of knowledge on information processing, researchers have developed a number of models employing schema- and script-like concepts (e.g., Minsky, 1975; Rumelhart & Norman, 1978; Rumelhart & Ortony, 1977). A schema is thought to represent a prototypical abstraction of a complex concept and is learned from past experiences with numerous exemplars of the concept. The script concept is similar, referring to the mental representation of a prototypical event, which evolves from encounters with a series of similar episodes.

A major prediction from schema and script theories is that this general knowledge about topics and events helps us to comprehend and assimilate new, related information (cf. Bransford & Johnson, 1972). There are two major benefits

that result from the use of schemata at the time of information encoding. First, novel information encoded with a schema will benefit from the strength of the existing associations that make up the schema. Second, the schema can add meaning to the comprehension process by providing additional information. When one of the constituent concepts of a schema is missing in the stimulus input, its features can be inferred from "default values" in the schema.

Many researchers have defended the schema/script concept by using a "cognitive economy" argument. For example, Schank and Abelson (1977) state:

Some episodes are reminiscent of others. As an economy measure in the storage of episodes, when enough of them are alike they are remembered in terms of a standardized generalized episode which we will call a script. Thus, rather than list the details of what happened in a restaurant for each visit to a restaurant, memory simply lists a pointer (link) to what we call the restaurant script and stores the items in this particular episode that were significantly different from the standard script as the only items specifically in the description of that episode. This economy of storage has a side effect of poor memory for detail. But such a side effect, we shall argue, is the price of having people able to remember anything at all. [p.19]

As Schank and Abelson note, there is a cost associated with the use of schemata and scripts. The addition of novel information to the shared schema entails competition for associations among all the instances necessarily sharing the same schema. Such competition should produce interference

in recall of the detailed instance information at the time of retrieval. Thorndyke and Hayes-Roth (1979) argue:

When multiple details instantiate a variable concept in a schema, it is assumed that they compete with one another for associations with the variable concept. As the number of competing details increases, a person's ability to discriminate (and thus recall correctly) the context in which each detail occurred decreases. The discriminability among details associated to a single variable concept is assumed to be an inverse function of the number of competing concepts and the temporal proximity of their occurrences. [p.87]

Caveats on Generalization

Although there has been a large amount of psychological research on interference-induced forgetting, the bulk of this research may not be relevant to the advertising field. There are a number of characteristics of the consumer environment that make it substantially different from domains traditionally investigated by psychologists. For example, product information is complex, often having visual, acoustic, and other sensory properties. When presented in an advertisement, it can assume emotional, humorous, or entertaining qualities, and may or may not be consistent with consumer's prior beliefs. Furthermore, the consumer might attend to and process that information for a variety of different reasons.

On the other hand, cognitive psychologists have looked most closely at the learning and forgetting of word pairs or simple sentences. These materials usually have little if anything to do with the prior knowledge or experiences of the experimental participant, who examines them solely for the purpose of performing well on an upcoming memory test. Neisser (1982), Jenkins (1977), and others have asserted that this stream of research has led to the development of memory models having little to do with the everyday operation of memory.

In the next section, attention will focus on the special qualities of product information and the marketing environment, and their effects on consumer learning and forgetting of advertisements.

ADVERTISING AND THE TRANSFER OF PRODUCT KNOWLEDGE

There are a number of different levels at which interference may enter into the process of the forgetting of advertised information. If brand names are organized hierarchically below a product class concept, then interference could occur at the category/brand level, where each new brand makes it more difficult for consumers to free recall brand names given the product class name as a memory cue. Similarly, if attribute information is organized by brand, then brand/attribute interference could occur, where additional learned attribute information about a brand, or similar competing brands, limits the consumers ability to recall old information about a brand's characteristics. These retrieval situations parallel two that the consumer is often faced with: (1) when a consumer is first considering the purchase of some type of product and is attempting to recall suitable brands, and (2) when the shopper is in a retail outlet with brand name cues and package information available and is attempting to remember additional product-relevant information.

In the present research, the decision was made to investigate the latter condition. It is assumed that one of the main roles of advertising is to make extra information

available to the consumer in the purchase situation. The consumer has the brand name available and tries to recall information about the brand to form some overall evaluation. Furthermore, the present author assumes that most advertisers are interested in differentiating their product from competitive products, making alternative brands less substitutable and the advertised brand less vulnerable to price competition. Therefore, the focus will be on consumer memory for distinctive brand characteristics.

Advertising Innovative Products

When a totally new product is introduced to the market, the nature of consumer learning through advertising may be different from the case where new brands in familiar product classes are introduced. In reference to the paired-associates learning task discussed earlier, researchers have suggested that an individual must first integrate both the stimulus and response terms of a word pair before what has been called the associative or hookup phase (Hayes-Roth, 1977; Martin, 1965; McGuire, 1961). With simple response terms, the relative difficulties of second list learning in the A-B C-D paradigm (different stimuli, different responses) and the A-B C-B paradigm (different stimuli, same responses) have been found to be about equal. On the other hand, with complex response terms, there is strong positive transfer in the A-B C-B condition as compared with the A-B

C-D condition because the former group of subjects could transfer their first-list response learning in mastering the second list, whereas the second group could not.

In the same manner, a consumer who encounters advertising for new products in a new and complex product class will need to learn and understand the general attributes of the product class (e.g., RAM, CPU, operating systems for microcomputers), as well as to link individual brand attributes with brand names (e.g., 8088 processor--IBM PC). For familiar product classes, only the latter step is necessary. This leads to the prediction that, for unfamiliar product classes, each additional ad for a brand within the product class will give reinforcing information about the product class. In addition, there will be a positive transfer of response learning, so that associations between new brand names and old product attributes will be learned more easily. Therefore, the total amount of recallable information about any particular brand will increase. Once the product class concept has been integrated, however, competitive ads will continue to reinforce this concept, but will have a detrimental effect on the learning and memorability of the distinctive attribute information associated with new brands because of associative interference and attribute confusion (see Figure 4).¹

1. The attributes of two similar brands may be retrieved, but confused, because of weak links between the brand names and attribute information.

Mean Recall of
Product Information

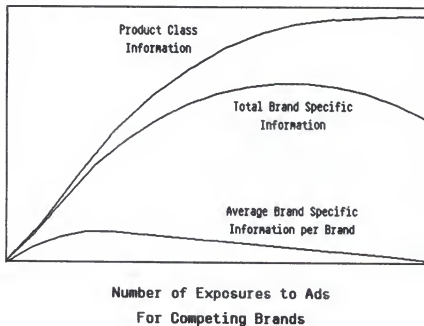


Figure 4: The transfer of product knowledge with additional exposures to advertisements for competing brands.

Advertising New Brands in Familiar Product Classes

For familiar product classes, the consumer will have a product class concept or schema in memory representing his or her knowledge about the common characteristics of brands within that product class. This prior knowledge facilitates the comprehension and assimilation of new information about brands, but leads to associative interference and confusion of their distinctive attributes. Therefore, if a consumer attempts to recall information about a recently advertised product, and he or she has also seen other ads for different brands in the same product class, there will be more forgetting of distinctive attribute information than if he or she has only seen ads for dissimilar products. One would also expect that the degree of interference will depend on the similarity of the various brands within the product class: the greater the overlap of common features, the more difficult the unique features will be to retrieve. (This expectation has been confirmed in list learning studies by Friedman and Reynolds, 1967, and Postman, Keppel, and Stark, 1965.) "Me too" brands, which share many features with the product class concept, will be at a disadvantage, as their few distinguishing features will be difficult to remember (Britt, 1978).

Brand Familiarity and Competitive Interference

With respect to consumer memory for a new brand's advertisements, there are a number of reasons to suspect that competitive advertising for highly familiar brands will interfere less than advertising for other, unfamiliar brands. First, if one assumes that there is some limit on the strength of associations in memory, then the memory links representing the familiar brand are probably already approaching the strength ceiling. Therefore, additional exposures to advertising for familiar brands would result in minimal increases in link strength, and minimal decreases in activation available for the remembrance of new brands (cf. Postman, 1965; Underwood, 1945). Furthermore, familiar brands probably rely less on the product class concept, developing into independent representational structures (i.e., they are "unitized"; Hayes-Roth, 1977). This would limit associative interference.

Consumers are also less likely to confuse remembered attributes of a new brand with those of highly familiar brands. Consequently, there should be less of a discrimination problem as a result of advertising for highly familiar brands than for other unfamiliar or moderately familiar brands (Anderson & Bower, 1974, p.473). Finally,

consumers may find advertising for familiar brands less interesting and devote less attention to it.

Motivational Factors

Up to this point, the consumer has been treated as a relatively passive processor of information. Yet, it is believed that people generally process information for a reason, and that these reasons will have a significant impact on the way they attend to and encode product information (cf. Craik & Tulving, 1975; Hyde & Jenkins, 1969; Morris, Bransford & Franks, 1977).

Advertising researchers have argued for some time that "reader interest" or "response set" has a substantial effect on memory for advertising (Appel & Blum, 1961; Maloney, 1961; Wells, 1964). This contention is well supported. For example, Hodock (1980) found on repeated occasions that target prospects recalled significantly more from television advertisements than non-prospects. Leo Bogart (1982) reports similar findings:

Some recent research conducted by the Newspaper Advertising Bureau shows that commercial recall among people watching a TV program is eight times as high among those who are watching personally as among those who say they just happened to be in the room where the set was on. Recall is twice as high among people who chose the program being watched as among those who did not, and more than twice as high among people who were watching TV exclusively as among those who were doing something else. [pp.40-41]

This effect has generally been attributed to selective attention. If print ads or television commercials are irrelevant to consumers' current needs, consumers will be disinterested and will not bother to look at the ads. If exposed, then they will spend little time thinking about the advertisements. Consequently, they will remember very little of the advertised information.

Even when interest and attention levels are high, consumers may be thinking about any one of a number of different aspects of an advertisement, which can affect their memory for the ad. March and Swinbourne (1974) describe two common reasons for ad interest:

The content of most TV commercials (and most advertising for that matter) may be thought of as having two aspects: (1) the relevant product message (what the advertiser wishes to communicate about his product or service), and (2) a nonproduct content, such as an actor's manner, dialogue, props, etc., which is irrelevant to the product message. On this basis, an individual can exhibit interest on two dimensions: interest in the product relevant message and interest in other things. [p.18]

If a consumer is interested in the product message (because, e.g., he or she plans to purchase some brand from the product class), he or she may intentionally process the message in a manner that makes it more resistant to forgetting. On the other hand, the person who is just interested in the executional characteristics of the ad may review the product information with relatively little mental elaboration. In the latter case, the mental representations

of the information would be more susceptible to retrieval interference. Maloney (1963) presents a similar argument. He notes that consumers who are in the market for a product, especially a product that is infrequently purchased and involves a greater than average purchase risk, may be less affected by competitive interference. He suggests that these consumers may set up a special "mental file" for information related to such purchases that will permit them to remember much more product information.

One reason that the information processed by the consumer interested in purchase would be more resistant to interference is that the individual may mentally compare and contrast the attributes of the various competing brands (Biehal & Chakravarti, 1982). This would leave associations in memory, not just from the product class concept to brand-attribute information, but also between brand-attribute representations. These additional memory links would provide a number of potential retrieval paths, reducing associative interference (Figure 5). Furthermore, comparative processing probably strengthens the links between brand names and attribute values, facilitating attribute differentiation.

Moeser (1977) derives similar predictions about the occurrence of interference effects from the resonance model proposed by Lockhart, Craik, and Jacoby (1976). She contends that interference will only be observed when related facts are stored in independent episodic traces.

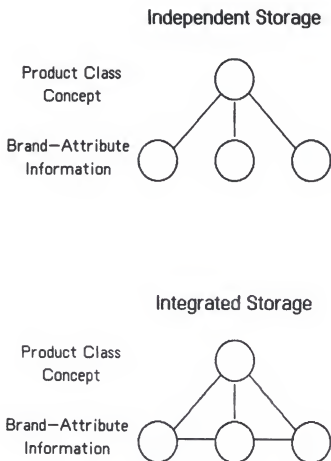


Figure 5: Associative network representations of independent and integrated storage of brand-attribute information.

When several facts about a concept are stored together in a single episodic trace, and a memory cue is presented which causes this trace to resonate, all of the associated information will be remembered. "Thus, it should be easier to retrieve a set of related facts when they have been stored as a single episode than to retrieve them when they have been stored independently of each other" [Moeser, 1977, p.43]. She finds that subjects who were encouraged to store related sentences in a single episodic trace (as measured by their ability to derive inferences from these sentences) had significantly better sentence recognition and cued recall scores than subjects encouraged to store the related sentences in independent episodic traces (Moeser, 1977, 1978).

Research by Smith, Adams, and Schorr (1978) on the "Paradox of Interference" is also supportive. They suggest that the integration of related facts can protect a learner from associative interference.

The first study to be described attempted to evaluate a few of these predictions about competitive interference by exposing subjects to magazine advertisements in a modified, retroactive inhibition paradigm. This research did not attempt to address the question of whether any information is ever totally lost from memory. Some part of forgetting is probably due to physiological decay. What is argued is that a great deal of forgetting is due to retrieval failure and attribute confusion. If this is the case, then it

suggests that memory for advertising can be improved by reducing retrieval interference.

Magazine advertisements were used in this research for a number of reasons. First, this creates an experimental situation which, to some degree, emulates a realistic ad-exposure situation. In a typical magazine, advertisements for a variety of different products often appear together. Many of these ads will be for different brands of products in the same product class. Second, the presentation rate of magazine ads is controlled by the viewer, thus allowing motivational factors to exert a greater influence on consumer information processing. Finally, magazine ads are typically more informational than television or radio commercials. This suggests that interference effects would be more prevalent for magazine advertising.

EXPERIMENT 1: RETROACTIVE EFFECTS OF COMPETITIVE ADVERTISING

The first study investigated factors influencing consumers' memory for magazine advertising using a retroactive interference paradigm. On the basis of the various information processing models of memory reviewed earlier, the following general predictions were made:

1. A consumer's ability to recall distinctive product information conveyed in an advertisement will be hindered if he/she subsequently sees another advertisement for a different brand of product in the same product class.
2. A consumer's ability to recall distinctive product information conveyed in an advertisement will be hindered if he/she subsequently sees another advertisement for the same brand of product, but representing a different model in a manufacturer's line.
3. The degree of interference will depend on the nature of the consumer's information processing objective at the time of advertisement encoding. The interference effects predicted above will be sizable if the

consumer reviews the two "similar" advertisements with a focus on the inherent interest value of each ad, but diminished if reviewed with the intention of purchasing a product from that product class.

Subjects

One hundred and fortyfour students enrolled in introductory psychology classes at the University of Florida participated in the first study. Participants were recruited with posted request sheets. Students who volunteered were given one hour of experiment-participation credit, which, in part, fulfilled certain lab requirements of their classes.

Procedure

All students were told initially that this study was designed to assess the reliability of a copytesting technique currently being used in advertising research.¹ After giving their approval to participate in the study (see Form 2, Appendix A), students were seated in front of a CRT

1. Experimenter instructions for the procedure appear as Form 1 in Appendix A.

terminal controlled by a TERA 8510a micro-computer, used to present information and take measurements.² Data were collected from one individual at a time.

Processing set manipulation. Twenty-four persons were randomly assigned to each of the 6 treatment conditions in the 2x3x3 fixed effect confounded block mixed factorial design (Winer, 1971). The first factor in this design, Factor A, was a completely between-group manipulation of information processing set. There were two levels of this manipulation. The first was meant to induce in the subject the sort of information processing motivation that might be characteristic of occasions when he/she is looking over an advertisement for a product that he/she is considering purchasing in the near future. That is to say, it should have stimulated participants to actively think about the advertised product in terms of the purchase situation. This processing set was encouraged by first telling each subject in this condition that he/she would be looking over the printed material from a number of different magazine ads during the next few minutes, and that he/she would be asked to indicate how likely it would be that he/she would purchase each of the advertised products (see Form 3,

2. Source listings of the computer programs that controlled studies 1 and 2 are presented in Appendix B. These programs were written in DEC MUBASIC, which runs under the DEC RT-11 operating system.

Appendix A). Subsequently, each ad was presented along with the following question:

How likely would it be that you would purchase this particular brand of product?

The second level of the processing set manipulation was designed to focus an individual's attention on each ad, much as he/she would if just admiring the material for its own inherent interest value. In order to create this processing set, participants were told, as above, that they would be looking over the printed material from a number of different magazine ads during the next few minutes, but then were further told that they would be asked to rate the inherent interest value of each of the ads (Form 4, Appendix A). Subsequently, the computer displayed each advertisement along with the following question:

Compared to most ads you are familiar with, how interesting would you consider this ad to be?

After receiving the initial instructions, individuals were shown and made judgments based on, 12 one-page product advertisements. The sequence of events is illustrated in Figure 6. These product descriptions were the printed copy portion of magazine advertisements for various products, which were found, through pretesting, to be relatively unfamiliar to subjects (see "Advertisement Copy," Appendix A). Participants were able to look over the material presented on the computer display and make judgments at their own pace. The time spent by the subject reviewing

each of the advertisements was unobtrusively measured and recorded by the computer.

Ad Position	Subject Task

	Complete "Informed Consent Form"
	v
	Read cover story
	v
1	Read control ad copy / make judgment
2	Read control ad copy / make judgment
3	Read "target" ad copy / make judgment
4	Read control ad copy / make judgment
5	Read "target" ad copy / make judgment
6	Read control ad copy / make judgment
7	Read "target" ad copy / make judgment
8	Read control ad copy / make judgment
9	Read control ad copy / make judgment
10	Read "similar" ad copy / make judgment
11	Read "similar" ad copy / make judgment
12	Read control ad copy / make judgment
	v
	Complete "Media Involvement Questionnaire"
	v
	Recall copy of "target" ads

Note. Advertisements tested for recall are under-scored. Experimentally manipulated advertisements are printed in boldface. The positions of the remaining ads were randomized for each subject.

Figure 6: Sequence of Experimental Events

Message-stream manipulations. Levels of Factors B and C were manipulated together as the confounded block part of the factorial design, and together determined the exact content and sequencing of the product advertisements to which subjects were exposed. Factor B represents a manipulation of the total number of ads which followed a

particular target ad.³ Alternatively, it can be thought of as a manipulation of the position of a particular ad in the total sequence of 12 ads. Target ads could appear either in position 3, 5, or 7 in the sequence. The positions of all other ads in the series were randomly selected by the computer for each subject (except for the two ads to be described as part of the Factor C manipulation). The particular brand of product advertised was manipulated as a counterbalanced factor. There were a total of three different target ads. (See listings of EXAD1.SRB, for the Bolens B7100DT lawn and garden tractor, EXAD4.SRB, for the Fujitsu Ten car stereo, and EXAD7.SRB, for the Eureka Space II tent, in Appendix A.) The third factor in the study, Factor C, was a manipulation of the context in which an advertisement appeared. A target ad could appear in the company of either

1. eleven ads for different brands of products in different product classes,
2. ten ads for different brands of products in different product classes, and one ad for a different brand in the same product class, or
3. ten ads for different brands of products in different product classes, and one ad for the same brand of

3. Target ads are those which participants were asked to recall later in the procedure.

product, but representing a different model in a manufacturer's line.⁴

Cued recall measures. After looking over and judging each of the 12 product advertisements in the sequence, the subject was asked to complete a short "Media Involvement Questionnaire," with general questions on magazine readership and TV viewing habits (see Forms 5 and 6, Appendix A). Immediately following the completion of this interpolated task, the subject was given a surprise recall test (Form 7, Appendix A). Specifically, participants were presented with the brand name, model designation, and product class name for one target ad at a time, and were asked to verbally report any information they could recall about each of the three ads. Subjects' verbal responses were tape recorded, and then transcribed and scored at a later time. The order in which the three brand name/product class name cue pairs were presented was randomized by the computer for each subject.

Verbal recall was considered preferable to using written recall protocols for a number of reasons. In terms of cue availability and attentional requirements, the verbal report task seems to be more similar to the consumer's remembrance task in a purchase situation than the written task. The written protocol methodology may encourage

4. Other than the manufacturer's name, there was very little overlap in the content of the two ads.

subjects to use recalled information as a cue for subsequent retrieval attempts, which may affect the remembrance process. The task of writing out information as it is recalled would also seem to be more attentionally demanding than verbal report, and may interfere with retrieval. Finally, written protocols may encourage subjects to try to reproduce advertisements verbatim, or go back and modify written memories as a consequence of subsequently recalled information.

After participants completed the recall test, they were asked if they were familiar with any of the products appearing in the ads and then questioned about their perceptions of the study's purpose. Finally, students were read a formal debriefing (Form 8, Appendix A), and all of their questions about the investigation were answered by the experimenter.

Scoring of the recall protocols was performed independently by two judges naive to the experimental treatments or predictions of this study. Each transcribed protocol, generated in response to a brand-name/model-designation/product-class-name cue combination, was compared with a listing of informational elements derived from the copy of each target ad (see Form 9, Appendix A). The recall score for each advertisement is the total number of matches found between phrases in the recall protocol and informational elements of the target ad. This can be thought of as a measure of "proven recall," in that the

recall score indicates the playback of informational elements from an ad which are not only correct, but are also specific to that ad. Incidence of confusions⁵ was also recorded.

5. A confusion is said to occur when an informational element from one ad appears in the recall protocol for another ad.

EXPERIMENT 1: RESULTS AND DISCUSSION

The primary objective of this study was to assess how a consumer's ability to remember a brand's advertising is affected by his or her subsequent exposure to advertising for other, similar products. An information processing model was invoked which predicted increased forgetting of distinctive brand-attribute information with successive exposures to ads for similar products, but only under conditions which minimize elaborative encoding of this information.

In order to evaluate these predictions, it was necessary to manipulate characteristics of consumer information processing during ad exposure. This was achieved by telling subjects that the purpose of the study was to assess the reliability of a copytesting technique currently being used in advertising research, and asking them to make one of two types of judgments about each of 12 ads presented on a computer display screen. The comments of subjects during a postexperimental debriefing indicated that subjects accepted this cover story and did not anticipate the recall task which followed ad exposure.

Preliminary Analyses--Ad Exposure and Judgment

After receiving the initial instructions concerning the judgment task and computer operation, participants were seated at a computer terminal and commenced to evaluate the 12 one-page product advertisements. The time spent by subjects reviewing each target advertisement and entering their judgments was unobtrusively measured and recorded by the computer. An analysis of variance was subsequently performed on these ad review and judgment times (see Tables 1 and 2).

Table 1
Sources of Variation in Ad Review Time

----- Analysis of Variance -----			
Source	df	MS	F
Judgment Task (J)	1	53.48	.11
Replication (R)	1	452.23	.96
Block(Rep) (B(R))	4	350.66	.75
J x R	1	838.90	1.79
J x B(R)	4	981.20	2.09
Error b	132	469.11	
Ad Context (C)	2	29.86	.32
Sequence Position (S)	2	227.18	2.46
Product Class (P)	2	5238.30	56.78*
J x C	2	190.86	2.07
J x S	2	51.45	.56
C x S	4	61.50	.67
J x C x S	4	92.52	1.00
Error w	270	92.26	

* $p < .001$

Table 2
Sources of Variation in Ad Judgment Time

Analysis of Variance			
Source	df	MS	F
Judgment Task (J)	1	114.08	2.07
Replication (R)	1	.04	.00
Block(Rep) (B(R))	4	17.63	.32
J x R	1	87.12	1.58
J x B(R)	4	160.94	2.92*
Error b	132	55.15	
Ad Context (C)	2	.09	.00
Sequence Position (S)	2	715.46	24.11**
Product Class (P)	2	2.01	.07
J x C	2	2.44	.08
J x S	2	13.13	.44
C x S	4	63.07	2.13
J x C x S	4	24.37	.82
Error w	270	29.68	

* $p < .025$ ** $p < .001$

The only factor that had a significant effect on the amount of time participants took to review ads was the product class of the target advertisement, $F(2,270)=56.76$, $p < .001$. As one might expect, subjects spent the most time examining the car stereo ad ($M=45.6$ seconds). Less time was spent on the lawn and garden tractor ($M=41.9$) and tent ($M=33.8$) advertisements. The type of judgments subjects were asked to make did not have an effect on ad review times (or on the time taken to make judgments, or ad judgment ratings, as shown in Table 3).

Table 3

Ad Review Time, Judgment Time, and Judgment Rating
as a Function of Judgment Task

Judgment Task	Review Time (seconds)	Judgment Time (seconds)	Judgment Rating
Ad Interest Value	40.8	12.5	5.4
Purchase Likelihood	40.1	11.5	5.7

Note. Judgment ratings could range from a low value of 1 to a high value of 9.

When an individual finished looking at an ad, and was ready to make a judgment, he or she first pressed the space bar on the computer terminal to clear the ad's image and print a judgment scale, then moved an arrow to the appropriate point over the scale using function keys, and then pressed the space bar again to record the judgment. Participants generally had no trouble using the computerized rating scale. The amount of time taken to record these evaluations was affected by only one of the experimental factors, the sequence position of the rated ad, $F(2,270)=24.11$, $p < .001$. As can be seen in Table 4, judgment time decreased with successive ad exposures. One would guess that subjects became faster as they gained experience with the computer rating procedure.

The actual ratings of the advertisements were also recorded by the computer. An analysis of variance of these ratings revealed only one significant factor (see Table 5).

Table 4

Ad Review Time, Judgment Time, and Judgment Rating
as a Function of Sequence Position

Sequence Position	Review Time (seconds)	Judgment Time (seconds)	Judgment Rating
3	41.6	14.5	5.4
5	40.7	11.3	5.4
7	39.1	10.2	5.8

Table 5

Sources of Variation in Ad Judgment Ratings

Analysis of Variance			
Source	df	MS	F
Judgment Task (J)	1	1077	1.97
Replication (R)	1	14	.03
Block(Rep) (B(R))	4	805	1.47
J x R	1	352	.64
J x B(R)	4	1058	1.94
Error b	132	547	
Ad Context (C)	2	134	.38
Sequence Position (S)	2	773	2.20
Product Class (P)	2	2798	7.95*
J x C	2	118	.33
J x S	2	120	.34
C x S	4	339	.96
J x C x S	4	111	.32
Error w	270	352	

* $p < .001$

The product class of the advertised product had a significant effect on subjects' evaluations, $F(2,270)=7.95$, $p < .001$. Individuals rated the car stereo advertisement more highly ($M=5.9$) than either the tent ($M=5.6$) or the lawn and garden tractor ($M=5.0$) advertisements. These ratings are consistent with pretest evaluations of ad interest value and product purchase likelihood.

Recall Tasks

After reviewing and judging each of the 12 product advertisements, subjects completed a short distractor task (i.e., the "Media Involvement Questionnaire"), and were then given a surprise recall test of the three target ads in positions 3, 5, and 7. Subjects took an average of 240 seconds to complete the Media Involvement Questionnaire, and 167 seconds to read through the recall task instructions. Therefore, on average, approximately 7 minutes elapsed between the presentation of the last advertisement and the start of the recall task.

For each target ad, participants were presented with the brand name, model designation, and product class name of the advertised product, and were given 2 minutes to verbally report any recallable information about this product. These protocols were tape recorded, and then transcribed and scored at a later time. The recall score for each ad is the

total number of matches found between phrases in the recall protocol and informational elements of the target ad. The confusion score is the number of instances when an informational element from a later, similar ad appeared in the recall protocol for the target ad.

Of the 432 recall protocols scored (3 per subject, 144 subjects), two judges independently arrived at the same recall total in 84% of the cases. As the judges were in general agreement about the coding of verbalized memories, the data were averaged across judges to yield a single total for each category (recall and confusions) and subject.

Cued recall performance. The cued recall data were modeled as a function of judgment task, ad context, and sequence position using an analysis of variance procedure. The results of this analysis appear in Table 6. The main effect of ad context on the average amount of correctly recalled advertised product information was highly significant, $F(2, 270)=12.81$, $p < .001$. Subjects' abilities to recall distinctive product information conveyed in an advertisement were hindered when they subsequently saw another advertisement for a different brand of product in the same product class, $F(1, 270)=13.94$, $p < .001$, or another advertisement for the same brand of product, but a different model in a manufacturer's line, $F(1, 270)=23.30$, $p < .001$. These results support the first and second hypotheses.

Table 6

Cued Recall of Product Information
as a Function of Judgment Task,
Ad Context, and Sequence Position

Analysis of Variance			
Source	df	MS	F
Judgment Task (J)	1	217.46	58.75***
Replication (R)	1	2.92	.79
Block(Rep) (B(R))	4	2.46	.67
J x R	1	.63	.17
J x B(R)	4	5.21	1.41
Error b	132	3.70	
Ad Context (C)	2	26.14	12.81***
Sequence Position (S)	2	3.46	1.69
Product Class (P)	2	12.24	6.00**
J x C	2	9.31	4.56*
J x S	2	.88	.43
C x S	4	2.28	1.12
J x C x S	4	1.95	.95
Error w	270	2.04	
*$p < .02$ *$p < .01$ ***$p < .001$			

Mean Cued Recall of Product Information			
Ad Context	Judgment Task		Marginal
	Ad Interest Value	Brand Purchase Likelihood	
Control	2.35	3.19	2.77
Different Brand	1.31	3.00	2.14
Same Brand	1.08	2.83	1.96
Marginal	1.58	3.00	2.29

A significant interaction between judgment task and ad context, $F(2,270)=4.56$, $p < .02$, indicates that the degree of impact of ad context on cued recall was dependent on whether subjects rated each ad on interest value, or the advertised product on purchase likelihood (see Figure 7). The nature of this Judgment Task x Ad Context interaction was investigated through the use of simple-effects tests of the influence of context on subjects' recall in the Interest and Purchase Likelihood conditions. For subjects who rated ads on interest value, there was a significant inhibitory effect of later, similar advertising on memory for advertised product information, $F(2,270)=32.5$, $p < .001$. This was not the case for subjects who rated the advertised products on purchase likelihood, $F(2,270)=2.24$, $p > .10$. This supports the third hypothesis, and indicates that a consumer's information processing objective may moderate the inhibitory effects of competitive advertising on memory for a product's ads.

The processing set manipulation also had a strong main effect on cued recall performance, $F(1,132)=58.75$, $p < .001$. In general, subjects remembered almost twice as much information if they reviewed the target ads with the intention of rating the advertised products on purchase likelihood, rather than rating the ads' inherent interest value.

If the amount of time a subject spent looking at an ad was influenced by the processing set manipulation, then one

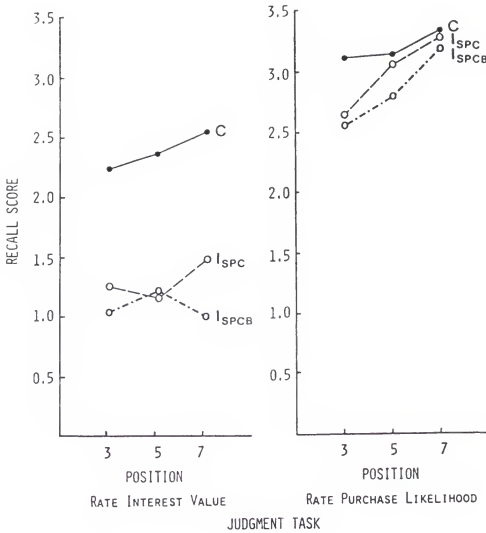


Figure 7: Cued product information recall as a function of judgment task, ad context (C=control; I_{SPC}=same product class, different brand; I_{SPCB}=same product class and brand), and sequence position.

might attribute differences in recall across conditions to attentional factors. Because there were no significant differences in mean viewing time across conditions, $F(1,132)=.11$, $p > .10$, the higher level of recall in the "purchase likelihood" judgment conditions was most likely due to the quality rather than the quantity of information processing. The purchase likelihood judgment task might have encouraged more self-relevant inferences (Rogers, Kuipur, & Kirker, 1977) or connections (Krugman, 1965, 1968), increasing the number of possible retrieval paths to the stored information. Alternatively, it might have caused subjects to focus on the brand-attribute associations, strengthening these links in memory.

As noted above, inter-advertisement interference was also evidenced for various products in a single manufacturer's product line: recall of the distinctive characteristics of one product was inhibited by subsequent advertising for another product in the line. This is consistent with the second hypothesis, and would seem to contradict the common belief that there is an advertising benefit for the firm that sells a number of similar products (Jagpal, 1981). Research suggests that there may only be a memorial benefit for the information common across ads.

It should be noted that the "same product class/different brand" and "same brand/different model" ads were not equated on amount of information. Therefore, differences in the mean recall of target ads in these two

conditions may have been due to the amount of interfering information in the similar ad rather than the nature of the similarity.

Cued confusions. When people were asked to recall information about a particular brand and model of product, they occasionally reported information that did not appear in the target ad, but did appear in another, similar advertisement in the sequence. These information confusions were modeled as a function of judgment task, ad context, and sequence position using analysis of variance (see Table 7). The main effect of ad context on the mean number of cued confusions was highly significant, $F(2,270)=38.81$, $p < .001$. As one would expect, individuals misattributed more brand-specific information to the asked-about product when they also saw an ad for another brand of product in the same product class, or another advertisement for the same brand of product, but a different model in a manufacturer's line (Figure 8).

Cued confusions were also more evident when the target ad appeared early (position 3, $M=.28$) rather than late (position 7, $M=.14$) in the sequence, $F(2,270)=3.16$, $p < .05$. The lapse of time between the ad presentation and recall test may have increased the difficulty of brand-attribute discrimination.

Although the purpose of this study was not to determine whether the source of interference-induced forgetting was

Table 7

Cued Confusions of Product Information
as a Function of Judgment Task,
Ad Context, and Sequence Position

Analysis of Variance			
Source	df	MS	F
Judgment Task (J)	1	.36	1.42
Replication (R)	1	.03	.11
Block(Rep) (B(R))	4	.47	1.83
J x R	1	.01	.06
J x B(R)	4	.12	.49
Error b	132	.26	
Ad Context (C)	2	8.99	38.81**
Sequence Position (S)	2	.73	3.16*
Product Class (P)	2	.37	1.61
J x C	2	.25	1.07
J x S	2	.20	.86
C x S	4	.34	1.47
J x C x S	4	.20	.88
Error w	270	.23	
* $p < .05$ ** $p < .001$			

Mean Cued Confusions of Product Information			
Ad Context	Judgment Task		Marginal
	Ad Interest Value	Brand Purchase Likelihood	
Control	.00	.00	.00
Different Brand	.15	.13	.14
Same Brand	.56	.41	.49
Marginal	.24	.18	.21

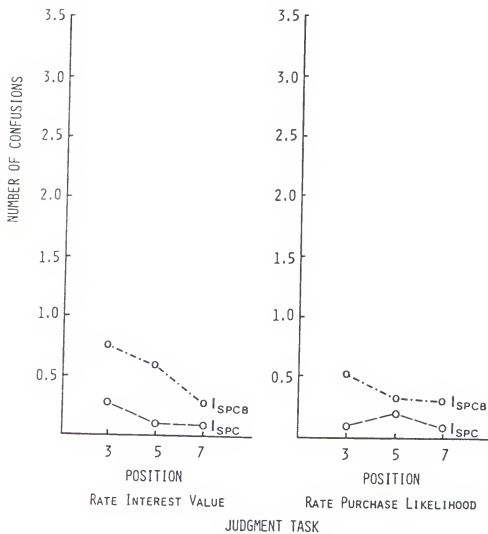


Figure 8: Cued product information confusions as a function of judgment task, ad context (C=control; I_{spc}=same product class, different brand; I_{spcb}=same product class and brand), and sequence position.

either retrieval failure or information confusion, some insight into this issue can be gained by looking at the relationship between information recall and confusion.

An increase in the amount of "similar" advertising was found to decrease the mean cued recall of target ads and significantly increase the mean number of intrusions. Yet, the judgment task did not have a significant effect on confusions, and the judgment task by ad context interaction for recall was not paralleled by such an interaction for intrusions. Intrusion rate remained at a relatively low level across all conditions (occurring in only 17% of the recall protocols). It would appear that the respondent's problem is not one of sorting out a number of readily available but confused memories, but of retrieving the attribute information.

This is somewhat inconsistent with the results of research by Thorndyke and Hayes-Roth (1979), who found a strong relationship between forgetting and number of intrusions in a study of interference in text learning. One explanation for this difference is that Thorndyke and Hayes-Roth tested memory under a much wider range of conditions of exposure to similar information (up to eight interfering paragraphs). This could have created significant discriminability problems for their subjects.

A second explanation is that the present study underestimated the total amount of confusion in ad recall. It was only possible to measure confusions with respect to

ads presented in the experiment. Yet, in many of the recall protocols, subjects reported information that did not appear in any of the ads. Some part of these responses might have been due to confusions with ads seen prior to the experiment.

Conclusions

The results indicate that the recallability of distinctive product information conveyed in a manufacturer's advertisements is significantly influenced by the number and variety of competitors' ads, and by that manufacturer's ads for other products in the product line. They also suggest that the "processing set" or intentions of consumers viewing the ads can moderate this effect. If the consumer anticipates purchasing the advertised product, he or she may encode the advertised information in a manner that makes it more resistant to interference-induced forgetting.

In this study, it was not possible to look at the effect of ad similarity and position on individuals' attention to, and memory for, later ads in the sequence. Therefore, one cannot say whether the second, similar ad reminded the respondent of the first ad, causing a reprocessing of the first ad at the expense of the second, or whether there was comparative processing of the two similar ads, leading to higher memorability of both ads.

These issues were examined in a second study using a proactive inhibition paradigm.

EXPERIMENT 2: PROACTIVE EFFECTS OF COMPETITIVE ADVERTISING

The retroactive interference effect observed in the last study is a somewhat "intuitive" finding in the sense that we all feel that information we have learned in the past gets buried deeper and deeper under new facts we learn. Proactive interference, in contrast, is less obvious. Research suggests that material learned in the past can inhibit our ability to learn and retain new, similar information.

Overview

The proactive interference phenomenon was first studied systematically by Benton Underwood of Northwestern University (1948a, 1949, 1957). He discovered the following effect:

. . . we give the subject a second list to learn and test him on this list 24 hours later. This time his performance is not quite so good as it was in [the first list]; he forgets more than 20 percent. We go on in the same way with a third list, a fourth, a fifth, and so on up to 20 lists. Plotting his successive performance on a graph, we find a startlingly sharp rise in his rate of forgetting. . . . In the case of the 20th list, 24 hours after learning it he has forgotten 80 percent of the items. [Underwood, 1964, p.5]

It appears that naive subjects are better able to retain new information than practiced subjects. This proactive inhibition effect was explained by Underwood as being due to the "spontaneous recovery" of responses to previously learned lists. The reemergence of these old responses interferes with the individual's remembrance of new list items by causing response competition and item confusion (Ceraso, 1967).

A demonstration of proactive inhibition with advertising materials was reported in an early study by Blankenship and Whitely (1941). They had subjects memorize grocery store advertisements, and preceded this task with either (1) no related activity, (2) the learning of nonsense advertising, or (3) the study of other, similar grocery store ads. They found that retention scores for the new material were significantly lower in the third condition than in either of the first two conditions.

Britt (1978) gives another marketing example where proactive interference may occur:

Proactive inhibition is a theoretical means of understanding that "me-too" advertising is likely to be a waste of marketing dollars. . . . Once competitor A has established a brand image through advertising, competitors B, C, and D, who follow almost identical copy strategies, will find their efforts diluted by the effects of proactive inhibition. The similarity among the various brands makes learning of the association between the message and the brand B name marginal in comparison to prior learning of the association between the copy strategy and the brand A name. [p.222]

The purpose of the next study was to determine if a consumer's ability to learn and remember information from a brand's advertising would be inhibited by previously seen ads for competing brands. The predictions were essentially the same as those for the first experiment:

1. A consumer's ability to recall distinctive product information conveyed in an advertisement will be hindered if he/she has previously seen another advertisement for a different brand of product in the same product class.
2. A consumer's ability to recall distinctive product information conveyed in an advertisement will be hindered if he/she has previously seen another advertisement for the same brand of product, but representing a different model in a manufacturer's line.
3. The degree of interference will depend on the nature of the consumer's information processing objective at the time of advertisement encoding. The interference effects predicted above will be sizable if the consumer reviews the two "similar" advertisements with a focus on the inherent interest value of each ad, but diminished if reviewed with the intention of purchasing a product from that product class.

Procedure

The second study used an experimental procedure identical to the one described earlier, except that the focus was on proactive rather than retroactive interference. Therefore, the ad presentation sequence was reversed. Ads presented early in the sequence were manipulated so as to be more or less similar to ads appearing later in the sequence. Recall of these later ads was tested after the completion of a short distractor task (i.e., the "Media Involvement Questionnaire").

As before, 144 subjects participated in the study. The design was a 2x3x3 fixed effect confounded block mixed factorial design. Factor A was a completely between-group manipulation of information processing set. Subjects were asked either to rate each advertised product on purchase likelihood, or to evaluate the inherent interest value of each ad.

Levels of Factors B and C were again manipulated together as the confounded block part of the factorial design. Factor B was a manipulation of the position of a particular ad in the total sequence of 12 ads. Target ads could appear either in position 6, 8, or 10 in the sequence (see Figure 9). The positions of the remaining ads in the series (except for the two "similar" ads in positions 2 and

3) were randomized for each subject. The particular brand of product advertised was counterbalanced across subjects. There were a total of three different target ads.

Ad Position	Subject Task

	Complete "Informed Consent Form"
	v
	Read cover story
	v
1	Read control ad copy / make judgment
2	Read "similar" ad copy / make judgment
3	Read "similar" ad copy / make judgment
4	Read control ad copy / make judgment
5	Read control ad copy / make judgment
6	Read "target" ad copy / make judgment
7	Read control ad copy / make judgment
8	Read "target" ad copy / make judgment
9	Read control ad copy / make judgment
10	Read "target" ad copy / make judgment
11	Read control ad copy / make judgment
12	Read control ad copy / make judgment
	v
	Complete "Media Involvement Questionnaire"
	v
	Recall copy of "target" ads

Note. Advertisements tested for recall are under-scored. Experimentally manipulated advertisements are printed in boldface. The positions of the remaining ads were randomized for each subject.

Figure 9: Sequence of Experimental Events

Factor C was a manipulation of the context in which an advertisement appeared. A target ad could appear in the company of either

- eleven ads for different brands of products in different product classes,

2. ten ads for different brands of products in different product classes, and one ad for a different brand in the same product class, or
3. ten ads for different brands of products in different product classes, and one ad for the same brand of product, but representing a different model in a manufacturer's line.

After reviewing and judging each of the 12 advertisements, subjects were asked to complete the "Media Involvement Questionnaire." This was followed by a surprise recall test, where participants were presented with a brand-name/model-designation/product-class-name cue combination for one target ad at a time, and were asked to verbally report any information they could recall about each of the three ads. These responses were tape recorded, and then transcribed and scored at a later time.

EXPERIMENT 2: RESULTS AND DISCUSSION

The purpose of the second study was to examine how advertising materials learned in the past can affect consumers' abilities to learn and retain new, similar information about other brands of products. The experimental procedure was identical to the one used in the first study, except that ads presented early in the sequence (positions 2 and 3) were manipulated so as to be more or less similar to the three target ads appearing later in the sequence (positions 6, 8, and 10). The judgments individuals made about each ad were manipulated as in the last study, and the ad exposure sequence was followed by the "Media Involvement Questionnaire" and recall tasks.

Preliminary Analyses--Ad Exposure and Judgment

The amount of time subjects took to review each advertisement and enter their judgments was again measured and recorded by the computer. The ANOVA results for the review time data appear in Table 8. These data are potentially more interesting than in experiment 1, because the target ads followed the manipulated context ads in this

experiment. Therefore, selective attention processes might have been operative: the amount of attention a person paid to an advertisement might have been affected by the number of ads for similar products seen previously.¹

Table 8
Sources of Variation in Ad Review Time

Analysis of Variance			
Source	df	MS	F
Judgment Task (J)	1	4.90	.01
Replication (R)	1	151.70	.31
Block(Rep) (B(R))	4	1632.83	3.38*
J x R	1	363.00	.75
J x B(R)	4	1689.35	3.50**
Error b	132	483.01	
Ad Context (C)	2	302.96	2.95
Sequence Position (S)	2	342.51	3.34*
Product Class (P)	2	6386.15	62.20***
J x C	2	10.71	.10
J x S	2	68.28	.66
C x S	4	40.36	.39
J x C x S	4	95.89	.93
Error w	270	102.68	
*$p < .05$ **$p < .01$ ***$p < .001$			

Ad context did have a marginally significant effect on ad review times, $F(2,270)=2.95$, $p < .07$. Participants took the most time to review the target ad when they saw no other

1. In most verbal learning studies of proactive inhibition, selective attention cannot operate because lists are learned to some performance criterion.

ads for similar products prior to this exposure ($M=39.6$ seconds). They spent less time examining the ad when they previously saw an ad for a different brand in the same product class, or another ad for the same brand of product, but a different model in the manufacturer's line ($M=36.9$ and 37.2 seconds, respectively).

One of the difficulties with interpreting these results is that subjects were required to make a judgment about each of the ads. Therefore, exposure was, in some sense, forced. One might expect stronger effects of advertising context on attention if ads were presented in a natural environment. As noted earlier, research on "clutter" by Webb (1979) does indicate that attention to television commercials drops off with successive ad exposures. Yet, the clutter research has not looked at the effects of ad similarity on commercial attention.

The sequence position of the target ad also had an effect on ad review times, $F(2,270)=3.34$, $p < .05$. People spent less time examining ads that appeared later in the sequence. The mean review time for ads in position 6 was 39.4 seconds, 38.1 seconds for ads in position 8, and 36.3 seconds for ads in position 10. This dropoff in attention may have been due to respondents' loss of interest, fatigue, or experience with the computer procedure.

Consistent with the results of experiment 1, product class had a strong effect on ad review time, $F(2,270)=62.20$, $p < .001$. Subjects again spent the most time examining the

car stereo ad ($M=43.5$ seconds). Less time was spent on the lawn and garden tractor ($M=39.7$) and tent ($M=30.6$) ads.

In the second study, none of the within subject or between group experimental factors had a significant effect on the amount of time taken by subjects to record their evaluations, $F(11,132)=.89$, $p > .10$, and $F(18,270)=.81$, $p > .10$, respectively. As in the first experiment, judgment times were found to decrease slightly for ads in later sequence positions (positions 6, 8, and 10, $M=10.2$, 10.0 , and 9.2 seconds, respectively).

The ratings of the target advertisements were also modeled as a function of judgment task, ad context, sequence position, and product class using ANOVA. The results of this analysis appear in Table 9. Once again, the product class of the advertised product was the only factor that had a significant effect on subjects' evaluations, $F(2,270)=10.63$, $p < .001$. Subjects rated the car stereo ad higher ($M=6.3$) than either the tent ($M=5.6$) or the lawn and garden tractor ($M=5.2$) advertisements.

As shown in Table 10, the types of judgments individuals were asked to make did not have an effect on the amount of time they spent reviewing or judging the ads, or on their judgment ratings. This matches the results of the first study, and suggests that any differences in information recall across conditions would be a consequence of the quality rather than the quantity of ad processing.

Table 9
Sources of Variation in Ad Judgment Ratings

Analysis of Variance			
Source	df	MS	F
Judgment Task (J)	1	913	1.61
Replication (R)	1	96	.17
Block(Rep) (B(R))	4	849	1.50
J x R	1	129	.23
J x B(R)	4	1444	2.55*
Error b	132	566	
Ad Context (C)	2	285	.70
Sequence Position (S)	2	555	1.36
Product Class (P)	2	4320	10.63**
J x C	2	109	.27
J x S	2	480	1.18
C x S	4	446	1.10
J x C x S	4	824	2.03
Error w	270	406	
* $p < .05$ ** $p < .001$			

Table 10
Ad Review Time, Judgment Time, and Judgment Rating
as a Function of Judgment Task

Judgment Task	Review Time (seconds)	Judgment Time (seconds)	Judgment Rating
Ad Interest Value	38.1	9.8	5.8
Purchase Likelihood	37.8	9.7	5.6

Note. Judgment ratings could range from a low value of 1 to a high value of 9.

Recall Tasks

Once people finished reviewing and judging the ads, they were asked to complete an interpolated task (i.e., the "Media Involvement Questionnaire"), and were then given a surprise recall test. Subjects took an average of 256 seconds to complete the questionnaire, and 121 seconds to read through the recall task instructions. On average, approximately 6 1/4 minutes elapsed between the presentation of the last advertisement and the start of the recall task.

As in the first study, participants were given 2 minutes to remember information about each of the target ads. Recall protocols were tape recorded, transcribed, and scored. The two scoring categories were the amount of advertised product information correctly recalled and the number of instances of attribute confusion with other, similar advertised products.

Cued recall performance. Analysis of variance was used to model the cued recall data as a function of judgment task, ad context, and sequence position. The results of this analysis appear in Table 11. The main effect of ad context on the average amount of correctly recalled product information was highly significant, $F(2,270)=9.95$, $p < .001$. Subjects' recalled less, distinctive product information

Table 11
Cued Recall of Product Information
as a Function of Judgment Task,
Ad Context, and Sequence Position

Analysis of Variance			
Source	df	MS	F
Judgment Task (J)	1	7.00	1.07
Replication (R)	1	3.17	.48
Block(Rep) (B(R))	4	4.46	.68
J x R	1	.00	.00
J x B(R)	4	4.95	.76
Error b	132	6.55	
Ad Context (C)	2	26.90	9.95*
Sequence Position (S)	2	4.19	1.55
Product Class (P)	2	19.80	7.32*
J x C	2	3.75	1.39
J x S	2	.45	.17
C x S	4	.84	.31
J x C x S	4	2.96	1.10
Error w	270	2.70	

* $p < .001$

Mean Cued Recall of Product Information			
Ad Context	Judgment Task		Marginal
	Ad Interest Value	Brand Purchase Likelihood	
Control	2.74	3.24	2.99
Different Brand	2.50	2.39	2.44
Same Brand	1.94	2.32	2.13
Marginal	2.39	2.65	2.52

from an advertisement if they were first exposed to an ad for a different brand of product in the same product class, $F(1, 270)=7.82$, $p < .01$, or an ad for the same brand of product, but a different model in a manufacturer's line, $F(1, 270)=19.46$, $p < .001$. The first and second hypotheses are, therefore, supported.

At first glance, these findings appear to be inconsistent with research showing a beneficial effect of consumers' prior knowledge or product-class "familiarity" on the learning of new product information. The results of studies by Srull (1983), Johnson and Russo (1984), and Alba (1983) reveal a positive relationship between familiarity and learning. High knowledge consumers are better able to learn and retain complex product information than low knowledge consumers when exposed under the same conditions.

In fact, there is no inconsistency. The beneficial effects of product class familiarity for the learning of new information about complex products were discussed earlier (see pp.27-29). These effects are seen to be due to the transfer of stimulus- and response-term learning to the new situation. In the present study, ads were pretested to insure that all participants were moderately familiar with the product classes of the advertised brands, and could comprehend the advertised information. In this case, old brand-attribute associations would be expected to interfere with memory for new, similar information through competition of associations and attribute confusion (cf. Srull, 1983).

Suprisingly, there was no interaction between ad context and subjects' judgment task with respect to cued recall performance, $F(2,270)=1.39$, $p > .10$, in contrast to the results of the first study. Therefore, the third hypothesis was not supported. Individuals did recall slightly more information when they were asked to score advertised products on purchase likelihood rather than rate ads on interest value ($M=2.65$ versus $M=2.39$), but this main effect of judgment task was not significant, $F(1,132)=1.07$, $p > .10$.

There are a number of possible explanations for why the purchase likelihood judgment did not significantly lessen interference-induced forgetting. As was noted earlier, proactive interference effects are usually found to be minimal immediately after information exposure, but grow with the passage of time. Given that there were an average of 11 pieces of product information presented in each target ad, there did not seem to be a ceiling effect on recall (grand mean = 2.52 pieces of recalled information). Yet, with the passage of time, attribute confusion might increase disproportionately in the interest value judgment condition. Therefore, the hypothesized interaction might only appear in a delayed test of recall.

Alternatively, the judgment task manipulation may not have had the intended effect on the information processing set of participants. Instead of comparing and contrasting the attributes of the similar, advertised products (which

would lead to integrated storage), or rehearsing the brand-attribute relationships (which would increase brand differentiation), people in the purchase likelihood condition might have processed the information in a relatively passive or unanticipated manner. This was more likely in this experiment because target ads were in later positions in the exposure sequence, and, as noted earlier, subject may have become fatigued, or bored with the task.

Cued confusions. The mean number of instances of product information confusion was relatively low in this study ($M=.14$). Confusions were noted in only 13% of the recall protocols. These data were modeled as a function of judgment task, ad context, and sequence position using ANOVA (see Table 12). There was a significant main effect of ad context on the mean number of cued confusions, $F(2,270)=18.83$, $p < .001$. Subjects misattributed more information to the target ad when they previously saw an ad for another brand of product in the same product class ($M=.11$), or an ad for a different model of the same brand of product ($M=.32$).

The results also revealed an unexpected interaction between ad context and sequence position, $F(2,270)=5.53$, $p < .01$. Looking across the data from the early to the later sequence positions (Table 13), confusions decreased in the purchase likelihood judgment condition, as one would expect, but tended to increase in the interest value

Table 12
Cued Confusions of Product Information
as a Function of Judgment Task,
Ad Context, and Sequence Position

Analysis of Variance			
Source	df	MS	F
Judgment Task (J)	1	.45	2.99
Replication (R)	1	.08	.55
Block(Rep) (B(R))	4	.06	.37
J x R	1	.01	.06
J x B(R)	4	.29	1.89
Error b	132	.15	
Ad Context (C)	2	3.25	18.83**
Sequence Position (S)	2	.33	1.93
Product Class (P)	2	.17	1.01
J x C	2	.18	1.02
J x S	2	.95	5.53*
C x S	4	.26	1.53
J x C x S	4	.14	.84
Error w	270	.17	

* $p < .01$ ** $p < .001$

Mean Cued Confusions of Product Information			
Ad Context	Judgment Task		Marginal
	Ad Interest Value	Brand Purchase Likelihood	
Control	.00	.00	.00
Different Brand	.13	.08	.11
Same Brand	.39	.25	.32
Marginal	.17	.11	.14

Table 13
Product Information Confusions
as a Function of Judgment Task,
and Sequence Position

Sequence Position	Judgment Task		Marginal
	Ad Interest Value	Brand Purchase Likelihood	
6	.06	.12	.09
8	.17	.17	.17
10	.30	.05	.17
Marginal	.17	.11	.14

judgment condition. Given the infrequency of confusions, this result may be spurious, as it is unclear why the mean number of confusions would be higher for ads shown closest in time to the recall task.

Conclusions

From the results of the second study, it would appear that advertising for competitive products can have a detrimental effect, not just on consumer memory for a brand's past advertising, but also on the the consumer's ability to learn and remember distinctive brand information presented in future advertising. It is not yet clear whether this proactive interference effect is moderated by

the consumer's information processing behavior at the time of ad exposure. The results of this study did not show such an interaction, but this may have been due to the short time interval between ad exposure and testing, and/or the manipulation of judgment task.

THE INTERACTIVE EFFECTS OF REPETITION AND COMPETITION ON MEMORY FOR MAGAZINE ADVERTISING

Without question, the most common method used by marketers to ensure that their advertising will be remembered is ad repetition. Consequently, researchers have shown considerable interest in the nature of the relationship between ad exposure frequency and consumer response variables, including memory, preference, and brand choice. In this section, the interactive effects of repetition and level of competitive advertising on consumer memory will be discussed, along with the results of a third study of memory for advertising.

The Threshold Effect

In discussions of the relationship between advertising and sales, there is general agreement that, at some frequency of advertising exposure, there are monotonically diminishing returns for increased levels of advertising. The theoretical foundation of this prediction at the individual level is that a given advertised message conveys less and less information with each additional exposure (Stigler, 1961).

A continuing controversy surrounds the question of whether there is an initial threshold in the response of sales to advertising; i.e., whether, at low levels of advertising, increases are increasingly effective up to some point, after which there are diminishing returns. According to Simon and Arndt (1980), ". . . the great majority of persons interested in advertising--advertising practitioners, media salesmen, economists, and laymen--seem to believe that the advertising response function has an inflection point and is S-shaped" [p.13]. Yet, from a review of over 100 empirical investigations, Simon and Arndt (1980) conclude that ". . . there are not increasing returns to advertising--that is, no S-shaped function--over the normal operating range" [p.24].

The results of a number of studies conflict with this conclusion. In aggregate level analyses across a number of market areas, Rao and Miller (1975) and Wittink (1977) find that the sales response curve for some products has a larger slope coefficient at higher advertising rates than at lower levels, indicating the lower region of an S-curve. Using an individual level analysis of panel data on product purchases and media exposure, McDonald (1970) also finds the S-shaped response curve.

There is sufficient inconsistency in reported findings to lead one to look for an explanation of the occasionally observed threshold effect, and the conditions necessary for its occurrence. This effect could occur as a consequence of

any one of the stages of the "hierarchy-of-effects" discussed earlier. Consumers may have to be exposed to an advertisement some minimum number of times before they (1) attend to it, or (2) comprehend it, or (3) agree with it, or (4) remember it, or (5) like the advertised product, or (6) buy the advertised product. A number of researchers have identified the attention stage as a likely candidate. Chamberlin (1962) suggests that control of the buyer's consciousness must be gained, and while it is being gained additional expenditure yields increasing returns. Similarly, Krugman (1972) contends that a consumer needs to be shown a commercial some number of times before it evokes the critical "What of it?" response, where the personal relevance of the advertised product is assessed.

The research reviewed earlier on interference-induced forgetting provides an alternative explanation of the threshold effect. It is hypothesized that, in an environment characterized by high levels of competitive advertising, there is some minimum level of advertising repetition below which the marginal response to advertising would be very small because the message is effectively "squelched." In information processing terms, associations between retrieval cues and brand information would not conduct sufficient activation to exceed the remembrance threshold for this information. For higher levels of advertising, the marginal response would improve as the strength of brand-attribute associations exceeds the minimum

level necessary for information retrieval in the context of competitive associations. However, in noncompetitive environments, there should be a more direct relationship between repetition level and learning (assuming that attention level and other factors are held constant), because weak associations could be effectively used to retrieve some part of the advertised information (see Figure 10).¹

There is suggestive evidence that the relationship between frequency of advertising exposure and consumer response is moderated by the level of competitive advertising. Geiger (1971), using data from a television diary panel and follow-up telephone interviews, estimated the effect of number of advertising exposures on ad recall. Suprisingly, she found no overall relationship between exposure frequency and recall. Yet, when she looked at exposure frequency relative to competitive levels of advertising, there was a positive effect on ad recall. This effect appeared to carry over to purchase intentions. Unfortunately, her data do not permit the evaluation of the threshold hypothesis.

This same effect is predicted for sales response by a number of competitive marketing models which borrow from

1. It is acknowledged that memory for advertisements is probably not the sole mediating variable determining the S-shaped advertising to sales relationship. As noted above, thresholds could exist at a number of other stages in the information processing sequence.

**Mean Recall of
Product Information**

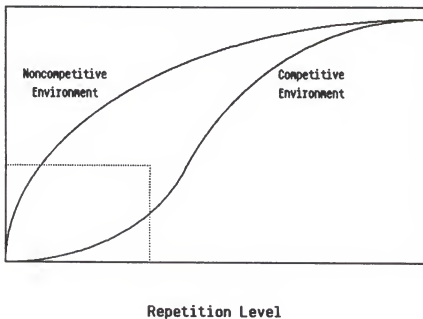


Figure 10: Product information recall with repeated ad exposures in competitive and noncompetitive media environments.

Lanchester's model of warfare (see the review by Little, 1979). For these models, the decay of advertising effectiveness is typically expressed in terms of the level of competitive advertising. They predict that one company's advertising response function depends on competing companies' advertising rates. Yet, they do not predict that high levels of competitive spending will lead directly to a threshold effect, as suggested above.

Memory for Pictorial Information

In the third study of this investigation, the decision was made to use real, full-color magazine advertisements rather than just the body copy from ads. Of course, when pictorial materials are used, memory for advertisements might be greatly enhanced. Research by Shepard (1967) and others indicates that visual information is more resistant to forgetting than verbal information. In his research, Shepard had one group of subjects study a set of magazine pictures, one picture at a time. Another group studied verbal material (sentences). Both groups were then tested on their ability to correctly distinguish between the studied material and new material. Shepard found 11.8 percent errors in the sentence condition, but only 1.5 percent errors in the picture condition. Kolers (1979) also reports outstanding memory performance for pictorial

information. Under appropriate circumstances, his subjects were able to recall visual details about a page of print's typography after a period of months. This strong memory for visual material could wash out any advertising interference effects.

Yet, in a study of memory for faces, Anderson and Paulson (1978) did find interference effects, using reaction-time measures in a recognition task. They also found that verbal information interfered with pictorial information and vice versa, suggesting that the two types of information share a common memory code. However, the observed cross-modality interference was much weaker than the within-modality interference.

Of course, the interest here is in probability of recall rather than speed of recognition. Despite the concerns mentioned above, it is hypothesized that a consumer's ability to recall distinctive product information conveyed in an advertisement will be inhibited by advertising for different brands of products in the same product class.

EXPERIMENT 3: REPETITION AND COMPETITION

In the third study, the intent was to investigate the relationship between memory for product information and ad repetition in various competitive environments, as well as to examine competitive interference effects with more realistic stimuli. From the reasoning presented earlier, it was predicted that:

1. A consumer's ability to recall distinctive product information conveyed in an advertisement will be a direct function of the level of repetition of that advertisement.
2. A consumer's ability to recall distinctive product information conveyed in an advertisement will be an inverse function of the level of advertising for different brands of products in the same product class.
3. The nature of the relationship between the level of repetition of an advertisement and recall of information about the advertised product will depend on the level of advertising for different brands of products in the same product class. Repetition will

have the greatest positive effect on recall when there is no advertising for "competitive" products.

Subjects

Ninetysix students enrolled in introductory psychology classes at the University of Florida participated in the third study. Participants were recruited with posted request sheets. Students who volunteered were given one hour of experiment-participation credit, which, in part, fulfilled certain lab requirements of their classes.

Procedure

All students were told initially that this study was designed to assess the reliability of a copytesting technique currently being used in advertising research, and to investigate the effects of ad repetition on ad evaluation.¹ After giving their approval to participate in the study (see Form 2, Appendix C), students were asked to respond to a "Product-Class Familiarity Questionnaire." Following this, each subject was seated in front of a

1. Experimenter instructions for the procedure appear as Form 1 in Appendix C.

Kodak 460 audioviewer/projector and a CRT terminal, both controlled by a TERAk 8510a micro-computer.² Data were collected from one individual at a time.

All subjects were told that they would be looking over a number of different magazine ads during the next few minutes, and that they would be asked to rate the inherent interest value of each of the ads (Form 3, Appendix C). Subsequently, the computer displayed each advertisement along with the following question:

Compared to most ads you are familiar with, how interesting was this ad?

Subjects were told to read through each ad completely and look at any accompanying pictures before making an evaluation (Form 4, Appendix C). It was emphasized that they should read through the ad even if it was seen on an earlier occasion in the study.

Individuals were shown and made judgments based on, 22 one-page product advertisements.³ The sequence of events is illustrated in Figure 11. These advertisements were photographic duplicates of real magazine advertisements for various products, which were found, through pretesting, to

2. The source listing of the computer program that controlled study 3 is presented in Appendix D. This program was written in CalTech FORTH, which runs under the DEC RT-11 operating system.

3. The first advertisement was used as an example by the experimenter to demonstrate terminal operation and the ad evaluation procedure.

Ad Position	Subject Task / Ad Content	

	Complete "Informed Consent Form"	
	v	
	Complete "Product-Class Familiarity Questionnaire"	
	v	
	Read and judge the following 22 ads	
	v	
1		Demo (Blaupunkt 3001 car stereo)
2		Control (Stimorol gum)
3		Control (Simac Pastamatic)
4	F3 - <u>Target</u>	or Control (Jenn-Air Range)
5		Control (Dunhill eyewear)
6		Control (Ungo Box car alarm)
7		Control (Simac Pastamatic)
8		Control (Dupont Pen)
9	F2 - <u>Target</u>	or Control (Magpro cookware)
10		Control (Pulsafe car alarm)
11		Control (Methode Elancyl Skin Care)
12	C3 - <u>Competitor</u> or	Control (Gravity Guiding System)
13		Control (555 cigarettes)
14	F1 - <u>Target</u>	
15		Control (Gargoyle sunglasses)
16	C2 - <u>Competitor</u> or	Control (Alden 44 sailboat)
17		Control (Aalborg liquor)
18		Control (Sasaki glassware)
19		Control (Bang & Olufson TV)
20	C1 - <u>Competitor</u> or	Control (Gelatio ice-cream maker)
21		Control (Fujitsu Ten car stereo)
22		Control (Faberware convection oven)
	v	
	Complete "Media Involvement Questionnaire"	
	v	
	Recall information from target ad	
	(Modified free recall)	
	v	
	Recall information from target ad	
	(Modified modified free recall)	
	v	
	Answer product evaluation, familiarity, and	
	manipulation-check questions	

Note. Advertisements tested for recall are underscored. Experimentally manipulated advertisements are printed in boldface. The positions of the remaining ads were held constant.

Figure 11: Sequence of Experimental Events

be relatively unfamiliar to subjects. Each ad included a headline, illustration, and body copy. Participants were able to look over advertisements presented on the projection screen and make judgments using the computer terminal at their own pace. The time spent by the subject reviewing each of the advertisements was unobtrusively measured and recorded by the computer.

Experimental manipulations. Eight persons were randomly assigned to each of the 12 treatment conditions in a 3x4 fixed effect between-group design. The first factor, Factor A, was a manipulation of target advertisement exposure frequency. There were three levels of this manipulation. Frequency could vary from 1 to 3 exposures. Within the total set of 22 ads, the target advertisement always appeared in position 14. In addition, a copy of this ad was substituted for the control ad which appeared in position 9 at frequency level 2, and in position 4 at frequency level 3.⁴

Factor B represents the level of "competitive advertising" in the sequence of ads. This four level factor could vary from 0 to 3. Advertisements for "competitive"

4. For all subjects, the advertisements in sequence positions 3 and 7 were identical (Simac Pastamatic), and the ads in positions 6 and 10, and positions 1 and 21 were for different brands of product in the same product class (Ungo Box and Pulsafe car alarms, and Blaupunkt and Fujitsu car stereos, respectively). This was meant to draw attention away from the experimental manipulations of repetition and competition.

products (i.e., products in the same product class as the target) did not appear in the sequence at competition level 0. At competition level 1, a competitive ad was substituted for the control ad in position 20. Another competitive ad was inserted in position 16 at competition level 2, and in position 12 at competition level 3. The particular brand of product appearing in the target ad was manipulated as a counterbalanced factor. There were a total of four different target ads (for the Audemars Piguet Royal Oak watch, the Mizuno running shoe, Grolsch Lager beer, and the Lada automobile).

Recall and evaluation measures. After looking over and judging each of the 22 advertisements in the sequence, each subject was asked to complete a short "Media Involvement Questionnaire" (see Form 5, Appendix C). Immediately following this interpolated task, the subject was given two surprise recall tests. In the first, participants were presented with the brand name, model designation, and product class name for the target ad, and were asked to verbally report any information they could recall about the advertised product for a two minute time period (see Form 6, Appendix C). In the second, subjects were just given the product class name for the target, and were asked to try to remember everything they could about any products in this product class that appeared in the slide sequence (Form 7, Appendix C). Four minutes were allotted for this task. The

purpose of the second recall task was to allow subjects to report any attribute information that they could recall about the product in the target ad, but withheld on the first recall task because of brand discrimination difficulties.⁵ For both tasks, subjects' verbal responses were tape recorded, and then transcribed and scored at a later time.

After participants completed the recall tests, they were asked about their interest in the target ad, their evaluation of the advertised product, their likelihood of purchasing the product, and their familiarity with both the target ad and the advertised product. They were then questioned about their perceptions of the study's purpose. Finally, students were read a formal debriefing, and all of their questions about the investigation were answered by the experimenter.

As in the first two studies, scoring of the recall protocols was performed independently by two judges naive to the experimental treatments or predictions of this research. Each transcribed protocol was compared with a listing of informational elements derived from the copy of each target ad (see Form 8, Appendix C). The recall score

5. Of course most subjects would be expected to recall more information about the target in the second free recall period regardless of the level of competition because they are given additional retrieval time. Therefore, the difference in information recall between the first and second recall periods cannot be attributed solely to brand discrimination difficulties.

for each advertisement is the total number of matches found between phrases in the recall protocol and informational elements of the target ad. Incidence of confusions was also recorded.

EXPERIMENT 3: RESULTS AND DISCUSSION

In order to determine the relationship between memory for product information and ad repetition in various competitive environments, the third experiment was conducted using a modified retroactive inhibition paradigm. In this study, photographic duplicates of real magazine advertisements were used instead of the textual materials employed in the first two studies, to assess the generalizability of the earlier findings.

Preliminary Analyses--Ad Exposure and Judgment

Individuals were shown and made judgments based on, a longer sequence of 22 magazine advertisements.¹ Participants were able to look over the advertisements and make judgments at their own pace. The time spent by subjects reviewing each of the advertisements, and their ratings of ad interest were unobtrusively measured and recorded by the computer. In this experiment, ad review times were not measured separately from judgment times. Ads were presented on a slide viewer while an interest rating scale was

1. Judgment task was held constant in this study. All subjects rated the advertisements on interest value.

simultaneously displayed on the computer terminal. Once an individual marked his or her response, the viewer automatically advanced to the next slide and the rating scale was redisplayed.

The position of the target advertisements was not manipulated in the third study. The target ads always appeared in position 14 of the sequence. All analyses to be presented refer to subjects' responses to ads in this position.

An ANOVA of the effects of ad repetition and product class on ad exposure/judgment times appears in Table 14. Ad exposure/judgment times for the target ads tended to decrease with an increasing number of prior exposures, although this effect was only marginally significant, $F(2,84)=2.78$, $p < .07$. It should be noted that subjects were encouraged to reread ads seen previously. Without these instructions, one would expect a much higher dropoff in attention due to the prior learning of advertised information and loss of interest.

The ratings of the inherent interest value of the target advertisements also declined with repeated exposures, $F(2,84)=4.81$, $p < .01$. As shown in Table 15, mean ratings dropped over one scale point (on a nine-point scale) with three exposures. Therefore, with regard to viewing time and interest ratings, there is some evidence that the target ads started to "wear out" with repetition (see discussion ahead).

Table 14
Ad Review/Judgment Time
as a Function of Repetition Level
and Product Class

Analysis of Variance			
Source	df	MS	F
Repetition Level (R)	2	1379.57	2.78
Product Class (P)	3	2586.84	5.22**
R x P	6	356.20	.72
Error	84	495.75	

** $p < .01$

Mean Ad Review/Judgment Time			
Repetition Level			Marginal
1	2	3	
53.5	40.9	43.9	46.1

As in the first two studies, the product class of the advertised brand was found to have a strong effect on both ad review times, $F(2,84)=5.22$, $p < .01$, and evaluations, $F(2,84)=4.87$, $p < .01$. Review times tended to correspond to the amount of body copy in the target advertisements, while interest ratings were closely related to pretest ad evaluations. Individuals gave the highest ratings to the beer advertisement ($M=6.5$). Lower ratings were assigned to the wrist watch ($M=5.7$), running shoe ($M=5.0$), and automobile ($M=5.0$) advertisements.

Table 15
Ad Interest Rating
as a Function of Repetition Level
and Product Class

Analysis of Variance			
Source	df	MS	F
Repetition Level (R)	2	281.66	4.81*
Product Class (P)	3	285.07	4.87*
R x P	6	46.43	.79
Error	84	58.56	

* $p < .01$

Mean Ad Interest Rating			
Repetition Level			Marginal
1	2	3	
6.1	5.7	4.9	5.5

Recall Tasks

After looking over and rating each of the 22 advertisements, and completing the "Media Involvement Questionnaire," subjects were given two recall tests. In the first, participants were presented with the brand name, model designation, and product class name for the target ad, and were asked to verbally report any information they could recall about the advertised product. In the second,

subjects were just given the product class name for the target, and were asked to try to remember everything they could about any products in this product class that appeared in the slide sequence. For both tasks, subjects' verbal responses were tape recorded, and then transcribed and scored at a later time.

The ads used in this study generally had a large number of visual and verbal details, some of which were irrelevant to the attributes or performance of the advertised products. Many subjects recalled these features. Therefore, memories for product and execution characteristics were coded in separate categories.² When developing the coding criteria, it was sometimes difficult to make this distinction, as the purpose of an ad might have been to associate an image (created by the execution) with the product. Yet, subjects were asked to recall product characteristics, and a pure measure of this was desired.

Of the 192 recall protocols scored (96 subjects, 2 protocols per subject, 6 categories per subject), two judges independently arrived at the same category total in 85% of the cases. The judges, then, were found to be in general agreement about the coding of verbalized memories. Therefore, the data were averaged across judges to yield a single total for each category and subject. These average

2. Execution characteristics included the positioning of pictures, coloration (other than that of the product), props and scenery, and models.

category totals were used in all of the subsequent analyses of the recall data.

Cued recall performance. The results of an analysis of variance of the effects of ad repetition, competitive advertising, and product class on cued recall of product information are shown in Table 16. In support of the first hypothesis, ad repetition had a significant impact on peoples' abilities to recall the distinctive product information presented in the target ads, $F(2,48)=9.98$, $p < .001$. Mean recall increased as exposure frequency was raised from one ($M=1.14$), to two ($M=1.59$), to three ($M=2.33$) exposures. The last copy of the target ad was always in position 14 of the exposure sequence. Therefore, this repetition effect cannot be attributed to differences in the time delay of the recall task across conditions.

The data also supported the second hypothesis: competitive advertising had a significant inhibitory effect on cued recall of product information, $F(3,48)=17.53$, $p < .001$. Mean recall of information presented in target advertisements was much higher when subjects saw no other ads for similar products ($M=2.85$) than when they saw one ($M=1.75$), two ($M=1.52$), or three ($M=.63$) ads for other brands in the same product class. Since the competitive ads followed the target ads in all but the last condition, it is argued that these effects are not due to attentional

Table 16
Sources of Variation in Cued Recall
of Product Information

Analysis of Variance			
Source	df	MS	F
Repetition Level (R)	2	11.50	9.98***
Competition Level (C)	3	20.17	17.53***
Product Class (P)	3	5.44	4.72**
R x C	6	2.69	2.33*
R x P	6	1.54	1.34
C x P	9	1.30	1.13
R x C x P	18	.61	.53
Error	48	1.15	
*$p < .05$ **$p < .01$ ***$p < .001$			

factors, but rather, to associative interference and confusion at the time of information retrieval.

A significant interaction between ad repetition level and competition level, $F(6,48)=2.33$, $p < .05$, indicates that the relationship between frequency of ad exposure and ad recall depended on the level of competitive advertising (see Figure 12). When there were no other ads for competitive products in the sequence of 22 advertisements, ad repetition significantly increased recall of distinctive information about the advertised brand, $F(2,48)=13.2$, $p < .001$. This was not the case when ads were repeated in the context of two or three ads for other brands in the same product class ($F(2,48)=.15$, $p > .10$, and $F(2,48)=.35$, $p > .10$, respectively). These results are consistent with the third

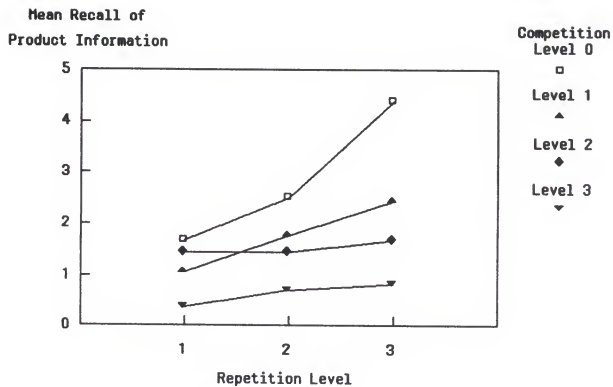


Figure 12: Cued product information recall as a function of ad repetition and competitive advertising.

hypothesis, that repetition will have the greatest positive effect on recall when there is no advertising for "competitive" products.

The shape of the memory response curve for the conditions with high levels of competitive advertising was what was expected based on reasoning presented earlier. However, in the no-competitive-advertising condition, the predicted downward concave response function was not observed. In fact, the curve was upturned slightly. This might have been due to the effects of subjects' prior knowledge. Subjects were probably exposed to a great deal of competitive advertising for the target product classes (e.g., cars, beer, watches, running shoes) before the start of the study. If this was the case, one would expect some proactive interference in all of the experimental conditions.

Data on the cued recall of ad execution characteristics were also analyzed using ANOVA (Table 17). Once again, ad repetition was found to increase recall, $F(2,48)=4.11$, with subjects recalling an average of .70, .92, and 1.39 pieces of execution information from ads presented once, twice, or three times, respectively. The manipulation of the amount of competitive advertising had no main effect, $F(3,47)=.25$, $p > .10$, and there was no interaction between repetition and competition level, $F(6,48)=.71$, $p > .10$ (see Figure 13). An interference effect was not predicted for memory of ad execution characteristics, as the various "competitive" ads

Table 17
Sources of Variation in Cued Recall
of Execution Information

Analysis of Variance			
Source	df	MS	F
Repetition Level (R)	2	3.95	4.11*
Competition Level (C)	3	.24	.25
Product Class (P)	3	6.07	6.32**
R x C	6	.68	.71
R x P	6	1.19	1.24
C x P	9	.85	.88
R x C x P	18	.66	.69
Error	48	.96	

* $p < .05$

** $p < .001$

were only similar in terms of product information, not style of execution.

Across all conditions, recall of ad execution characteristics was low (grand mean=1.01). In part, this was due to the wording of the recall instructions, which focused attention on the advertised product rather than the ad itself. The poor performance might also have been due to the quantity of advertising in this experiment. Even though the manipulation of competitive advertising did not affect memory for execution characteristics, recall may have been depressed by the 19 to 21 ads for other products surrounding the target ad.

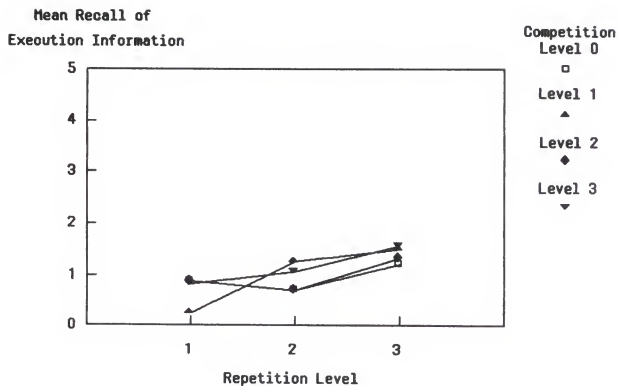


Figure 13: Cued execution information recall as a function of ad repetition and competitive advertising.

Free recall task. After the cued recall task (brand name cue), subjects were asked to report anything they could remember about any advertised brands in the named product class. Protocols were scored on the amount of additional information recalled about the target brand. This parallels the Barnes and Underwood (1959) "modified modified free recall" procedure (MMFR). The MMFR task is used to examine whether some responses that were not voiced during the cued recall task were actually recalled but withheld because of response competition or context discrimination difficulties.³

If increasing levels of competitive advertising led to decreasing levels of performance in the cued recall task and increasing performance levels in the MMFR task, it would suggest that the interference effect was due to an increase in attribute confusion, rather than a decrease in the accessibility of brand information (although both processes might be operative). In fact, none of the experimental factors had a significant effect on the amount of product information, $F(47,48)=.82$, $p > .10$, or execution information, $F(47,48)=.70$, $p > .10$, recalled in the free recall task. Subjects free-recalled an average of .54

3. As noted earlier, all subjects would be expected to recall additional information from the target ad during the free recall task because of an additional four minutes of time for reminiscence. This cannot be attributed solely to brand-attribute confusion.

pieces of additional product information, and .33 pieces of additional execution information.

Interference and Product Evaluation

From the earlier results, it is clear that memory for a manufacturer's magazine advertisements can be inhibited by advertising for other brands in the same product class. There may also be effects of competitive advertising on consumers' evaluations of the advertised brand. If competitive advertising causes consumers to remember less about an advertised product, and everything in the advertisement is positively evaluated, then consumers should have a lower evaluation of the advertised product under high interference conditions. This would only be expected in cases where the product is relatively unfamiliar, and the consumer is relying heavily on remembered advertising for product information.

Alternatively, the unretrievable product information might be reconstructed by the consumer using prior knowledge of the product class. If these inferences are less positive than the original information, then product evaluations based on this information would be reduced.

Finally, interference might not block the retrieval of product information, but could limit its salience or distinctiveness. This may lessen the information's impact

on consumer judgment (cf. Tybout, Calder, & Sternthal, 1982).

In the present study, after the completion of the free recall task, subjects were asked to rate their interest in the target ad, and their evaluation and likelihood of purchasing the advertised product. All three of the experimental factors had a significant impact on subjects' ratings of ad interest value (see Table 18 and Figure 14). Level of ad repetition and competition both had a curvilinear relationship with interest ratings. With increasing ad exposures, interest ratings first rose, and then declined, $F(2,48)=3.80$, $p < .05$. Similarly, the evaluation of the target ad increased in response to the first ad for a similar product, but then decreased, $F(3,48)=3.04$, $p < .05$. The latter effect may have been due to an initial anchoring or comparison with the similar product's ad.

The product class factor was again significant, $F(3,48)=4.35$, $p < .01$. The mean ratings of the various target ads were essentially the same as measured at the time of ad exposure (see above).

Contrary to expectations, the experimental factors had no significant effect on product evaluation, $F(47,48)=.83$, $p > .10$. Competitive advertising did not influence individuals' evaluations of the target product. The purchase likelihood judgment was significantly affected by only one factor; product class, $F(3,48)=11.14$, $p < .001$.

Table 18
Sources of Variation in Post-Recall
Ad Interest Ratings

Analysis of Variance			
Source	df	MS	F
Repetition Level (R)	2	233.84	3.80*
Competition Level (C)	3	187.34	3.04*
Product Class (P)	3	267.93	4.35**
R x C	6	27.22	.44
R x P	6	32.01	.52
C x P	9	106.32	1.73
R x C x P	18	61.61	1.00
Error	48	61.59	
* $p < .05$ ** $p < .01$			

On a nine-point scale, subjects rated themselves as being much more likely to buy the advertised brand of beer ($M=5.3$) than either the running shoes ($M=4.1$), wrist watch ($M=3.2$), or automobile ($M=2.7$).

Unfortunately, the measures of product evaluation and purchase likelihood followed the two recall tasks in this study. Therefore, carryover effects may have distorted the results, hiding the typical effects of the manipulated factors on consumer judgment.

Interpreting Repetition Effects

As was noted earlier, the experimental procedure encouraged subjects to reread duplicate ads in the sequence

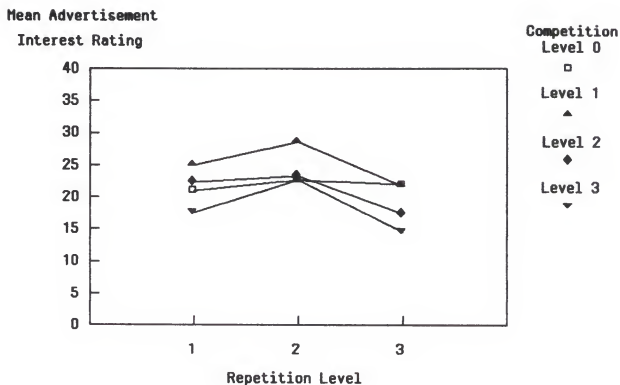


Figure 14: Advertisement interest ratings (0=low, 40=high) as a function of ad repetition and competitive advertising.

in order to maintain moderate levels of ad attention. Of course, when considering the typical effects of ad repetition, one cannot assume that the consumer will continue to react to an ad in the same way on each exposure. When an individual sees a magazine ad for the first time, and he or she is interested in the ad or in buying the product, he or she is likely to read through the copy and examine any accompanying picture. On subsequent exposures, he or she may notice the ad, recognize it as one seen before, and do a minimal amount of additional processing. This may cause repetition to lead to better memory for the picture and headline (which are easily processed), but not for the body copy, no matter what the level of competitive advertising.

Consumer response to repeated broadcast advertisements may be different. Calder and Sternthal (1980) suggest that a television commercial loses effectiveness with repeated exposure (i.e., it "wears out") for two reasons. First, viewers may lose interest in the ad and stop attending to the message. Second, they may start to generate negative mental reactions to the ad (see also Belch, 1982; Cacioppo & Petty, 1979; Simon, 1982).

In order to sustain attention levels in print and broadcast advertising, it is probably necessary to run variations on a theme, rather than repeat a single ad (cf. Berlyne, 1966). Supporting this, Adams (1916) reports that when the same print advertisements were repeated four times,

they were less effective in increasing ad recall than were four variations of each ad. However, the earlier analysis suggests that some caution should be taken with this approach. If the variations are too divergent, they will impede the development of a brand image, and cause associative interference.

GENERAL DISCUSSION

Interference and Consumer Memory

In this paper, three experimental investigations of interference in consumer memory were presented. From the results of this research, it would appear that a consumer's ability to remember distinctive product information from a manufacturer's ads can be inhibited by advertising for competing brands, or for other products in that manufacturer's product line. The results suggest that the size of this interference effect can be substantial (experiment 3), and that such effects can occur in response to small amounts of advertising for similar products. (Recall inhibition was observed in the first two studies with the manipulation of only a single ad.) From these findings, one might infer that a substantial part of consumer forgetting of some products' advertising is due to retrieval interference and confusion in memory.

Of course, the size and importance of interference-induced forgetting would depend on a number of factors. One such variable is the motivation of the consumer at the time of ad exposure. In the first experiment, it was found that

the type of judgment participants were asked to make about each ad interacted with ad context to determine information memorability. There was a significant interference effect when subjects rated the target advertisements on interest value, but no effect when the advertised products were scored on purchase likelihood. If one assumes that the judgment tasks employed in this experiment were similar to the reasons consumers typically have for processing ads, then one might conclude that competitive advertising would have the strongest inhibitory effect on the memory of consumers who are not in the market for a product, or who do not have the ability and/or the motivation to process ads in a manner that will enhance information retrievability.

A second factor is the type of product advertised. As noted earlier, Bettman (1979) and others have argued that recognition rather than recall is more important for consumer decisions about low-involvement products. Past research suggests that if consumers choose between products by attempting to discriminate between familiar and unfamiliar brands, competitive interference effects would not be significant (e.g., Postman & Stark, 1969).¹ On the other hand, if they base their selection on recalled

1. In a study by Postman and Stark (1969) using a multiple-choice procedure and an A-B, A-D design, no significant retroactive inhibition was found. This procedure allows judgments to be accurately made based on item recognition. When the same materials and comparable levels of original and interpolated learning were used with a recall procedure, there was substantial retroactive inhibition.

attribute information (as would be expected for more costly or self-image-related products), then competitive advertising should have a significant effect on the amount and quality of information recalled, and subsequent product judgments.

Product evaluation would also be more strongly influenced by brand recognition than recall when there are few common attributes across competing brands, and/or when attribute evaluation is very subjective. In these situations, it is hard for the consumer to compare the various brands on attribute performance. Brand familiarity, which would be relatively unaffected by competitive interference, could be used as a simple heuristic for choosing between brands.

The significance of interference-induced forgetting would also depend on the stage of the advertised product in the product life cycle, the evaluation of recalled information, and the amount of brand information physically available at the time of choice (see the earlier discussion, pp.5-6).

Interference and Product Evaluation

With respect to the effects of competitive advertising on consumer judgment, the results of the third study were inconclusive. Interest ratings of target ads were found to

first increase and then decrease with successive exposures to ads for similar products. Yet, the rated preference or likelihood of purchasing the advertised brands was not affected.

One explanation is that subjects remembered the evaluative judgments that they were asked to make at the time of ad exposure, and used them solely, or in conjunction with recalled brand characteristics, to make product decisions. These summary judgments might be more resistant to interference than the individual pieces of brand-attribute information presented in the advertisements. The recall measures used in the present research were somewhat limited in their ability to determine what individuals actually retrieved from memory. Although verbatim recall was not required, some remembered details, such as sensory experiences, evaluative reactions, or past judgments, would not be picked up by the scoring procedure.

Additional research is necessary which focuses on the remembrance process, and the relationship between advertising context and product evaluation and choice. The bulk of published research examining consumer decision strategies has made the decision-relevant information readily available to consumers during the decision process. A number of marketing scholars have argued recently that this is highly artificial, as many consumer decisions are made with only a small amount of physically available information, the rest coming from memory (Bettman, 1979;

Biehal & Chakravarti, 1982, 1983; c.f., Wright & Kriewall, 1980).

One might predict a number of possible effects of information remembrance and retrieval interference on choice. In addition to the processes described earlier (pp.112-113), inter-brand interference may limit the number of dimensions of a product that are salient to the consumer for memory-based judgments. This may cause consumers to use only a few attribute dimensions when evaluating relatively complex products. Even when information is recalled, interference may reduce the certainty associated with that information because of decreased retrieval speed or fragmentary recall. The consumer may assign a lower judgment weighting to such information.

In high interference situations, the retrieval cues that happen to exist at the time of judgment could have a major impact on the amount and type of information remembered. If these cues vary across purchase instances, memory based judgments may be relatively unstable. Consequently, there may be a significant amount of brand switching. Alternatively, the consumer may have less confidence in his/her ability to remember brand-specific information in such situations, and stick with the brands purchased most recently. This would result in a higher level of brand loyalty.

Marketing Implications

This research has a number of implications for marketing strategy decisions, including media selection and scheduling, choice of advertising creative approaches, and the use of promotional materials and product packaging. In the following discussion, these implications will be reviewed, with a focus on how best to teach consumers product information through advertising. Other aspects of consumer response (e.g., persuasion, attitude change) will receive less attention.

Media class and vehicle selection. The decision about where to advertise is generally made on the basis of knowledge of the media habits of the target segment, and the compatability of the medium and vehicle with the product's attributes and advertising appeal (Aaker & Myers, 1982). This ensures that the message will reach those consumers most likely to buy the product, and will be enhanced by the characteristics of the medium.

To the extent that the forgetting of product information is due to brand-attribute confusion, an additional criterion for media selection might be the relative weight of competitive advertising in each medium class and vehicle. One would expect that a consumer's

ability to discriminate between brands would increase if brand advertisements were presented in different contexts. The medium could serve as a cue to aid discrimination between confused memories. Therefore, advertisers might improve communication effectiveness by avoiding communication channels that are dominated by their competitors.

Repetition and media scheduling. As one would expect, overall product-information recall progressively increased as ad exposure frequency was raised from one to three exposures in experiment 3. Of greater interest is the finding that ad repetition only had a positive effect on recall when there was little or no advertising for similar brands, suggesting an initial threshold in consumer response to advertising in media environments characterized by high levels of competitive advertising.

Of course, only a small segment of the total possible memory response curve was examined in the third study.² It is expected that ad repetition in the context of competitive advertising would eventually have a positive effect on consumer memory (assuming that attention to the target ads can be maintained). Overlearning of brand-attribute associations through heavy repetition should make these

2. This decision was the consequence of concerns about possible subject fatigue and loss of interest in the task if the ad review sequence was lengthened to include additional exposures to the target ads.

links relatively resistant to interference from related materials.

However, the overlearned material would never be totally resistant to interference. The effect of learning trials in reducing retroactive inhibition eventually asymptotes (see, e.g., Briggs, 1957). Retroactive interference has been observed even with world knowledge that one would presume was heavily overlearned (Lewis & Anderson, 1976). This indicates that reminder advertising would be necessary to maintain brand information retrievability even for highly familiar brands.

The discussion above suggests that an effective media schedule for a new brand entry in a heavily advertised product class would first use short periods of heavy ad repetition to overcome the initial threshold in consumer response to advertising (i.e., "flighting" or "pulsing"). With repetition, a brand image should develop in memory that is relatively resistant to associative interference and confusion. Once this brand image has formed, a lighter schedule of ad repetition would be all that is needed to maintain the retrievability of brand-attribute information (cf. Katz's, 1980, proposed sliding schedule of advertising weight).

Repetition and consumer processing set. If one assumes that repetition functions, at least in part, by overcoming retrieval interference through the strengthening of

associations between brand names and attribute information, then one would predict that repetition would have a greater effect in situations where consumers review ads with an interest in the ads' executions (low brand-attribute elaboration) rather with the expectation of purchasing the advertised products (high brand-attribute elaboration). The results of the third study do not allow the evaluation of this hypothesis, as subjects' judgment task was not manipulated. Yet, a study by LoSciuto (1968) gives suggestive support. LoSciuto investigated whether product usage would influence the relationship between number of ad exposures (1, 4, or 7) and brand recall. He found a significant interaction between usage and frequency. Recall for nonsmokers was lower than for smokers at the low repetition levels, but was about equal for both groups at seven exposures.

Retrieval cues. Marketers may be able to reduce interference-induced forgetting by creating strong links between advertised information and the product purchase situation. For example, ad-related memory cues might be provided at the point of purchase; either on POP displays or product packaging (Bettman, 1979). Research by Tulving and Psotka (1971) indicates that retroactive interference can be reduced through the presentation of appropriate retrieval cues.

Future Directions

The research presented here leaves a number of questions unanswered. The most important unresearched issue may be the possible differences between short and long term forgetting effects. For example, in the short term, associative interference may be the main cause of forgetting. Therefore, memory for a manufacturer's ad may be inhibited equally by 10 ads for the same competing brand, or 10 ads for 10 different competing brands. On the other hand, in the long run, there may be much more interference in the latter case because of confusion of the large number of attributes (cf. Ceraso, 1967). It would be desirable to measure ad memorability at a number of points in time after ad exposure, so that the rate, as well as the quantity of forgetting can be determined.

Another research direction derives from characteristics of the recall protocol data discussed earlier. Many subjects who did not recall information initially were able to recall more after reminiscing for a period of time. This suggests that time pressure could limit the accessibility of information and magnify interference effects. Retrieval interference effects may be most apparent when the consumer is under significant time pressure in the shopping environment, or when he or she is not actively trying to

remember product information. Distraction may have similar, inhibitory effects on information accessibility.

Retrieval interference effects may also be magnified if, at the time of encoding, advertisements are presented in a communicator-controlled medium, where the consumer has little time to compare and contrast product attributes. One might argue that, even when the consumer is considering purchasing the advertised product, interference will be likely if the consumer's processing capacity is overtaxed.

A number of issues concern the effects of the quality and quantity of competitive advertising. In the earlier discussion it was predicted that memory for an unfamiliar target ad will be affected more by an ad for an unfamiliar brand in the same product class versus an ad for a familiar brand in the same product class. If this hypothesis is supported by research, then, when modeling the relationship between ad exposure and consumer response, one might want to include a parameter representing the negative effects of competitive advertising inversely weighted by the estimated prior knowledge of the consumer about the advertised brands.

Future investigations should also examine the effects of a wider range of ad repetition levels on consumer memory, preference, and choice. As noted above, while low levels of ad repetition might result in memories that are squelched by competitive advertising, higher levels would be expected to make ads resistant to interference-induced forgetting. In

such research, it would be important to use natural conditions of ad exposure so that the joint effects of attentional and memory factors can be measured.

In conclusion, additional research on competitive interference and consumer judgment should (1) give us guidance in the development of advertising appeals and promotional materials that have a sustaining influence on consumers, and thereby make the best use of advertising dollars, (2) lead to better models for making media selection and scheduling decisions, and (3) allow the assessment of the effects of heavy levels of advertising on consumers' knowledge about brands, and their ability to make informed choices.

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APPENDIX A
EXPERIMENTAL MATERIALS--STUDIES 1 AND 2

Form 1 - Experimenter Instructions

EXPERIMENTER INSTRUCTIONS
FOR EXPERIMENT # 82-26
(Bryan Hall, Room 302)

BEFORE THE SUBJECT COMES . . .

- (1) Turn the computer on by pushing the rocker switch up to the middle position.
- (2) Open the disk drive door and push in the disk until it clicks.
- (3) Close the disk drive door.

The computer will print . . .

Enter the date (DD-MON-YY), press RETURN --

- (4) Type in the date: one or two digits for the day, three letters for the month, and two digits for the year, each separated by hyphens. Then hit "RETURN". For example, 11-FEB-82
Always use the number keys at the top of the keyboard; not those on the far right of the keyboard.

The computer will print . . .

To skip the time press 0, then press RETURN.
Enter the current time (HH:MM:SS) --

- (5) Type in 0 and then hit "RETURN".

At this point, the computer will automatically load and start the correct computer program. The computer will then print . . .

Subject number (followed by <CR>)?

- (6) Check off the next unchecked subject number on the "Subject Run Sheet."
- (7) Then, type this number into the computer and hit "RETURN".

After a short period of time, the computer will print . . .

Press <SPACE BAR> to begin.

- (8) Press the "SPACE BAR". The computer will then print the subject instructions. Read these so you'll know whether the subject will be rating ads on interest value, or products on purchase likelihood.
- (9) Finally, make sure there's a copy of the "Media Involvement Questionnaire" on top of the disk drive unit.
- (10) Now, go outside and look for a subject for EXP #82-26.

If the subject doesn't show up within 10 minutes of the appointed time, and this is the last subject you are running, erase the check-mark on the "Subject Run Sheet." Then, press ETX, wait for the computer's "READY" message, and go to step (26).

WHEN THE SUBJECT IS IN THE ROOM . . .

- (11) Ask the subject to fill out and sign one copy of the "Informed Consent Form" (on the table behind the computer).
- (12) If the subject decides to participate, ask him/her to read the instructions on the display screen. If the subject has questions, you can explain how he/she will look at each ad and make ratings, and will fill out the "Media Involvement Questionnaire." Do not say anything about the recall task or the tape recorder.
- (13) After the subject presses the "SPACE BAR", demonstrate the response procedure to him/her using the Coca-Cola example.
- (14) If the subject has no questions, tell him/her that the computer will now present the series of advertisements. At this point, you can go and sit down at the table in Room 303.
- (15) The subject should come to Room 303 and notify you when it's time to start the recall task.
- (16) First, check the tape-counter to see if sufficient tape is left for this subject. If not, then put in a new tape and reset the tape-counter to 000.
- (17) Next, write the subject's "Project ID Number" on the record-sheet for that cassette, along with the tape-counter position. Turn on the microphone.
- (18) Position the microphone in a spot that is comfortable for the subject. Then, move to the stall to the left of the computer and put the tape-recorder in the RECORD and PAUSE modes. Make sure the recorder is NOT in the play mode.

Now, tell the subject to procede.

- (19) When you hear the first beep, take the tape-recorder out of PAUSE mode to start recording. When you hear the second beep, put it back in PAUSE mode.
- (20) When the subject has finished the recall task, turn off the tape recorder.
- (21) Finally, read the subject the "Debriefing", answer any questions, and sign his/her credit slip. Ask the subject if he/she expected the recall task, and if he/she has any suggestions or comments about the study. Write these down soon after the subject leaves on the back of his/her questionnaire. Also, urge the subject not to discuss the experiment with any of his/her friends or classmates until after the semester is over.
- (22) Show the subject out of the lab room.

WHEN THE SUBJECT IS GONE . . .

- (23) Put the microphone back in its original position, and put the subject's materials on the table face down

The computer will again print . . .

Subject number (followed by <CR>)?

- (24) If you are going to run another subject through the experiment, go to step (6).
- (25) If you are done running subjects, do not type in another subject number. Just hit "RETURN".

The computer will then print . . .

READY

- (26) Open the disk drive door, remove the disk, and return it to its cardboard sleeve. Then, turn off the computer by pushing the rocker switch down, and turn off the microphone.
- (27) Finally, turn off the light, and make sure the door is closed and locked.

Form 2 - Informed Consent Form

Subject's name _____

Subject's address _____

Project Number _____ Project Title- Evaluation of copytesting techniques in advertising research.

Principal Investigator - Ray Burke Date _____

Purpose of the project and procedures to be followed:

The purpose of this project is to assess the reliability of a copytesting technique currently being used in advertising research. Students participating in this study will be seated at a computer terminal and asked to look over a number of different advertisements presented sequentially on the display screen. After reviewing each ad, students will be asked to make an evaluation. When an individual has finished reviewing and judging the materials, he/she will be given the "Media Involvement Questionnaire," with general questions on magazine readership and TV viewing habits.

Risks and benefits:

There will be no risks associated with participation in this study. Students may benefit from participation by being exposed to a popular advertising copytesting technique. Further, participating students will receive one hour of experiment-participation credit. There will be no monetary compensation awarded.

I have read and I understand the procedure described above. I agree to participate in the procedure and I have received a copy of this description. I further agree that the information gained from this investigation may be used for educational purposes which may include publication. I understand that I may ask questions and withdraw my consent at any time without prejudice.

Signatures: _____
 subject _____ date _____

 witness _____ date _____

 principal investigator date _____

Form 3 - Purchase Likelihood Judgment Instructions

GENERAL INSTRUCTIONS

Over the next few minutes, you will be shown a number of different advertisements presented sequentially on this display screen. After looking over each ad, you will be asked to indicate how likely you might be to purchase the particular brand of product being advertised. Please take all the time you need to read over each of the ads and to rate each of the products on purchase likelihood. When you have finished reviewing and judging all of the ads, you will then be asked to complete a printed questionnaire with general questions on magazine readership and TV viewing habits.

TERMINAL OPERATING INSTRUCTIONS

When you have taken all the time you need to look over an advertisement, press the <SPACE BAR> at the bottom of the terminal keyboard. At that time, the ad will be erased, and you will be asked to indicate how likely you would be to purchase the advertised product. Please respond by first moving a cursor (printed at the far left or right side of the screen) to the appropriate point above the purchase likelihood scale. The cursor can be moved to the right by holding down the '/' key, and to the left by holding down the 'Z' key. Then, mark your answer by pressing the <SPACE BAR>. After you have marked your answer, the display will be erased, and the next advertisement will be printed.

Form 4 - Ad Interest Judgment Instructions

GENERAL INSTRUCTIONS

Over the next few minutes, you will be shown a number of different advertisements presented sequentially on this display screen. After looking over each ad, you will be asked to indicate how interesting that ad was to you. Please take all the time you need to read over these ads and to rate each of them on inherent interest value. When you have finished reviewing and judging all of the ads, you will then be asked to complete a printed questionnaire with general questions on magazine readership and TV veiwing habits.

TERMINAL OPERATING INSTRUCTIONS

When you have taken all the time you need to look over an advertisement, press the <SPACE BAR> at the bottom of the terminal keyboard. At that time, the ad will be erased, and you will be asked to indicate how interesting that ad was to you. Please respond by first moving a cursor (printed at the far left or right side of the screen) to the appropriate point above the interest rating scale. The cursor can be moved to the right by holding down the '/' key, and to the left by holding down the 'Z' key. Then, mark your answer by pressing the <SPACE BAR>. After you have marked your answer, the display will be erased, and the next advertisement will be printed.

Form 5 - Media Involvement Questionnaire Instructions

* Thank you for reviewing and judging *
* each of the advertisements. *

Now, please look to the right of this computer terminal for a copy of the "Media Involvement Questionnaire." The purpose of this questionnaire is to gather information about your magazine readership and TV viewing habits, and to assess how you perceive, use, and respond to media communication. Please take all the time you need to answer each of its questions completely and accurately. When you have finished answering all of the questions, press the <SPACE BAR> on the terminal keyboard.

Form 6 - Media Involvement Questionnaire

Media Involvement Questionnaire

Please take all the time you need to answer each of the following questions as accurately as possible.

- (1) On average, how many hours a week do you spend . . .
 . . . watching television? _____
 . . . reading magazines? _____

- (2) Do you watch any TV show(s) on a regular basis?
 _____ Yes _____ No

If so, please list them below in decreasing order of preference (up to 5).

- (a) _____
 (b) _____
 (c) _____
 (d) _____
 (e) _____

- (3) Do you read any magazine(s) on a regular basis?
 _____ Yes _____ No

If so, please list them below in decreasing order of preference (up to 5).

- (a) _____
 (b) _____
 (c) _____
 (d) _____
 (e) _____

- (4) Check the items below that you personally agree with.

Advertising on TV
is usually . . .

Advertising in magazines
is usually . . .

- (a1) appealing _____
 (b1) annoying _____
 (c1) informative _____
 (d1) exaggerated _____
 (e1) believable _____
 (f1) boring _____
 (g1) persuasive _____

- (a2) appealing _____
 (b2) annoying _____
 (c2) informative _____
 (d2) exaggerated _____
 (e2) believable _____
 (f2) boring _____
 (g2) persuasive _____

Form 7 - Recall Task Instructions

* Thank you for completing the *
* "Media Involvement Questionnaire" *

Finally, we would like you to answer a few questions about the products you saw advertised earlier. In the next few minutes, the names of three of these products will be printed, one at a time, on this display screen. Each product name will be displayed for exactly 2 minutes. During this time, PLEASE TRY TO REMEMBER EVERYTHING YOU CAN ABOUT THE PRODUCT. You will be provided with a tape-recorder so that you can record any remembered information. During the 2 minute recall period, just say anything you can remember about the named product into the microphone of the recorder. It is not necessary for you to recall the exact words in the product's advertisement. The time you have remaining will be indicated by a count-down clock, printed in the upper-left-hand side of this screen. When 2 minutes have elapsed, the product name will be erased. Then, when you indicate that you are ready, the next product name will be printed. After all three product names have been displayed for the 2 minute period, the study will be over.

At this time, please ask the experimenter to prepare the recording equipment.

Form 8 - Debriefing

DEBRIEFING

The procedure you have just been exposed to represents one from a broad class of procedures for pretesting printed advertisements, called "portfolio tests". These techniques can be described as having the following characteristics:

- One or a number of advertisements to be evaluated are presented to consumer respondents as part of a total set, or portfolio, of ads. This portfolio is presented to the respondent with a statement such as, "In the next few minutes, you will be able to look over a number of different advertisements. Please read over them, much as you would if you were going through a magazine, taking as much or as little time as you like. After you've finished, I'd like to talk with you about some of the ads."
- After the respondent looks over the portfolio of ads, the interviewer removes the materials from view and asks for recall of the ads just viewed.

The effectiveness or impact of an advertisement is measured in terms of the number of respondents who can recall seeing the ad. It is often required that the respondent describe the target ad in enough detail to assure that this recall is not attributable to other ads which the respondent might have seen at an earlier time for the same brand of product.

In the present study, we are not interested in measuring the impact value or recallability of any particular ad, as an advertiser might be, or in determining how reliable or valid this portfolio test procedure is for measuring advertising effectiveness. Rather, we are trying to gain an understanding of how an ad for one brand of product might facilitate or interfere with an individual's ability to remember other ads for the same brand, and competitive brands of products.

Given the large number of ads a consumer might be exposed to after watching an hour or so of TV or reading through a magazine, one would think that marketing researchers would have invested considerable time and effort in the study of the influence of surrounding ads on the effectiveness of target advertisements. In fact, this is not the case. Marketers have done very little research on how a consumer's exposure to one ad might enhance or hinder the effectiveness of another ad, seen at a later time. The work that has been done has examined the effects of TV "clutter", or the concentration of ads in a station break,

on consumer attention. This investigation, in contrast, is focusing on the question of whether an individual will be more or less likely to attend to and recall information from an advertisement after looking over other information which is either similar or dissimilar to it. For example, would a consumer have more trouble recalling from an ad that a Toyota gets 29 miles per gallon in the city if he/she earlier saw an ad saying that a Datsun gets 27 mpg than if he/she earlier saw a commercial for a Maytag washing machine?

A number of theorists in cognitive psychology would predict that as an individual learns an increasing number of associations between a particular concept and a variety of attributes, the probability of being able to recall any one of the attributes, given the concept name as a cue, will decrease. Similarly, a consumer who learns about an increasing number of cars may be less well able to recall information about any particular car if he/she is organizing information in memory around the common concept "car". Other theorists make opposing predictions. We are hoping to be able to test these predictions with the results of this study.

The specific information we've collected today will be seen and known only by the researchers involved in this study, and will not be coded with individual-identifying information, such as names or social-security numbers. In their final form, the data will be combined into statistics which will describe how students in general are either helped or hindered in their efforts to recall product information by having reviewed other information at an earlier time which is either similar or dissimilar to it.

You can understand now that if people came into this study with a preformed notion of what was being investigated, they would probably treat the product advertisements in the portfolio differently than if they were not aware of the research question of interest. For this reason, it's very important that you don't talk with your friends or classmates about this study, at least until the end of this quarter. Otherwise, the time we've spent today will be wasted.

Do you have any questions about the study?

Thank you for your participation.

Form 9 - Protocol Scoring Criteria

RECALL SCORING CRITERIA FOR IE1 AND IE2

Product Class - Lawn and Garden TractorsTarget - **Bolens B7100DT lawn and garden tractor (EXEC#0)**

Product Characteristics

can raise corn.
can grade a driveway.
can dig a trench.
can post a hole.
is 16 hp.
can lift.
can till.
can plow.
is a scaled-down farm tractor (not a beefed up riding
mower).
has a diesel engine.
has 4-wheel drive.
has 6 forward speeds.
has a 3-point hydraulic hitch.

Another advertised lawn and garden tractor:

is "a tractor you can trust."
is "a smart investment."
is 8 hp.
grooms the lawn like a push mower.
has a convenient place to rest your feet.
has all its controls in one easy-to-reach place.

Product Class - Car Stereos

Target - Fujitsu Ten car stereo (EXEC#1)

Product Characteristics

is called the Dashboard Wizard.
has a digital display
memorizes 7 AM stations.
memorizes 7 FM stations.
scans up and down.
tells time.
is auto-reverse.
accommodates chrome tape.
accommodates metal tape.
has a graphic equalizer.
has Dolby.
reduces hiss.

Another advertised car stereo:

has exceptional FM sensitivity.
has incredible multipath signal rejection.
has superb separation.
has virtually inaudible distortion.
has unnoticeable wow and flutter.
has 45 watts of power.
has feather touch electronic controls.
has Automatic Tape Slack Adjustment (ATSA).
keeps tape from belching out of the dashboard.

Product Class - Camping Tents

Target - Eureka Space II tent (EXEC#2)

Product Characteristics

has headroom of 6' at the eave.
has headroom of 8' at the center.
has a 12' x 12' square floor.
has a window on every wall.
packs smaller than a golf bag.
has a pre-connected frame.
can be raised in 10 minutes by first-timers.
has been used on expeditions.
is made of nylon.

Another advertised tent:

uses the fabric as an integral structural support.
has stress distributed throughout the tent.
has a 7' x 7' square floor.
has 3 1/2 foot high walls.
has a twin-track zippered door.
has no-see-em netting.
has an Easton aluminum frame.
has a shock-corded frame.

Advertisement Copy - EXAD1.SRB

CAN YOUR LAWN AND GARDEN TRACTOR
RAISE CORN?

Naturally your lawn and garden tractor can cut the grass. But can it cut the mustard when it comes to heavier work? Can it help you raise corn? Can you use it to grade that new driveway? Can it dig a trench? Or a post hole?

The Bolens B7100DT is a demon for hard work. In fact, you won't find another 16 hp. tractor in America that can do more kinds of jobs. From mowing the lawn to heavier chores like plowing, tilling, digging, and lifting.

The Bolens B7100DT isn't just a beefed-up riding mower. Instead, it's a scaled-down farm tractor, complete with such farm-type features as a fuel-saving diesel engine, 4-wheel drive, six forward speeds, and a 3-point hydraulic hitch.

So if you're looking for a hardworking midsize tractor, please remember, our Bolens tractor is looking for work.

Advertisement Copy - EXAD2.SRB

"My Wheel Horse riding mower makes things
a whole lawn easier.
You can depend on it."

And that's important when keeping up your yard is a labor of love. The last thing you want is downtime. You need a tractor you can trust.

For me it's my Wheel Horse. Around the house, in the garden or on the lawn, my Wheel Horse is a real work horse. Because it does so many different jobs, I get more done in less time. Talk about a smart investment . . .

Visit your nearest dealer and find out why you can do it all on a Wheel Horse.

You can do it all on a
WHEEL HORSE

Advertisement Copy - EXAD3.SRB

"The Bolens rider handles the work.
The rest is up to you."

"There's no point in having a big yard if you're too busy taking care of it to enjoy it." What you need is the Bolens B4200 8 hp. riding mower. It operates with ease and grooms your lawn like a push mower. It's a machine you can climb onto - with a convenient place to rest your feet, all the controls in one easy-to-reach place and enough muscle to mow through grass that should've been cut days ago.

The Bolens B4200 8 hp. rider will do all this, and make short work of it too. Then, the rest is up to you. For further details about the Bolens B4200 riding mower and the full line of lawn and garden tractors, check the Yellow Pages for the Bolens dealer nearest you.

Bolens makes short work of it.
FMC

Advertisement Copy - EXAD4.SRB

The Dashboard Wizard.
Before, there was only car stereo.

Put aside everything you've been told about car stereo. The Fujitsu Ten Dashboard Wizard is with us! This in-dash preamp combination system will transform your car. The precise digital electronic tuner memorizes 7 AM and 7 FM stations, searches up, searches down, scans, and even tells you the time.

His auto-reverse cassette deck accommodates chrome and metal tapes. His five-band graphic equalizer lets you match the music to your car. And with Dolby on both FM and tape, hiss has definitely become a thing of the past.

Any resemblance to ordinary car stereo is a figment of your imagination.

Fujitsu Ten: The best sound on wheels.

Advertisement Copy - EXAD5.SRB

THE SPARKOMATIC SOUND.
CAR STEREO FOR THE TRAVELIN' MAN
WITH EARS OF EXPERIENCE.

Now, Sparkomatic has introduced its radically new High Power SR 3300 Car Stereo. With exacting high performance high fidelity credentials. A tuner with exceptional FM sensitivity; incredible multipath signal rejection; superb separation; and an integrated cassette with virtually inaudible distortion and unnoticeable wow and flutter.

The power: a bone shaking 45 watts.

Sparkomatic's SR 3300 High Power AM/FM Stereo with Auto Reverse Cassette has some other impressive high fidelity touches as well. Like feather touch electronic controls and sophisticated tape handling capabilities.

All told, a component-looking package that delivers faithful high fidelity in its purist form.

SPARKOMATIC

Advertisement Copy - EXAD6.SRB

Does your car stereo
get car sick?

You know the nauseating facts. You're cruising down the highway all set to hear your favorite cassette when suddenly it's devoured. And when you go to its rescue, your car stereo simply belches out a floor full of tape.

But you can solve all that with the Fujitsu Eight Auto Reverse car stereo with ATSA, our new Automatic Tape Slack Adjustment feature. It automatically loosens tight tape and tightens loose tape before play. Which guarantees your music will be heard and not eaten.

So you'll always have your music the way you want it: coming out of your speakers, and not your dashboard.

Fujitsu Eight: The best sound on wheels.

Advertisement Copy - EXAD7.SRB

Discover the tent that stands tall and packs small.
SPACE II

Headroom is 6' at the eave - 8' in the center. The floor is 12' by 12' square. There's a window on every wall. Yet it packs smaller than a golf bag. The pre-connected frame makes assembly so easy, first-timers raise it in 10 minutes. And it's so durable, expeditions used it on the world's highest mountains. New nylon Eureka! Space Tent II: The family vacation package for the '80s!

EUREKA!
Tentmaker for expeditions,
backpackers and campers
since 1895

Advertisement Copy - EXAD8.SRB

The Art of Shelter

One thing we have always wanted to do, was to offer the same excellence of design in family camping tents that we have offered in our backpacking tents. Today we can say we have done it. When you own a Moss tent, you know that it is the innovative design that will keep you sheltered. Stress is distributed throughout the tent because the fabric is an integral structural support rather than a mere outer covering. As with all Moss patented designs, our new tents are easy to erect, totally functional with maximum space and simply beautiful.

MOSS
Moss Tent Works

Advertisement Copy - EXAD9.SRB

Discover the shape that outperforms the dome
MUSHROOM

Outside, the Mushroom-shaped tent sheds wind and weather. But inside, it's square - 7x7 feet of usable space. Near-vertical walls are 3 1/2 feet high so over-6-footers can sit tall. Twin-track zippered door. No-see-em netting. Shock-corded Easton aluminum frame. Expedition quality throughout. The Eureka! Mushroom: More tent in less pack space than you've ever seen.

EUREKA!
Tentmaker for expeditions,
back-packers and campers
since 1895

Advertisement Copy - EXAD11.SRB

Something New About Our Olde Fashioned Ham.

For over 80 years we've been cutting, curing and smoking our Olde Fashioned Hams the way J.M. taught us.

And we still use 16 pounds of the best pork to make 7 pounds of Olde Fashioned Ham.

We've only changed one thing. Now, we guarantee it. Each Olde Fashioned Ham is individually registered to guarantee your complete satisfaction or money refunded.

Because J.M. would have insisted.

You can still taste the difference quality makes.

Schneider's

Advertisement Copy - EXAD12.SRB

SHOULD ALL DRIVERS PAY THE
SAME AUTO INSURANCE PREMIUM?

Of course, not. Some drivers can save up to 20% a year on their auto insurance premium with Commercial Union's CUSTOM AUTO PROGRAM. It's an insurance plan that lets you control the cost.

How? CUSTOM AUTO costs are figured on your driving record, not your age or sex; on how many miles you drive, on what type of car you drive, and for what purpose you use it.

All of these factors and more . . . factors you control . . . determine your auto insurance costs.

If you'd like to learn more about saving money with CUSTOM AUTO, call the nearest independent insurance agent listed who represents Commercial Union.

CUSTOM AUTO
Where you control the cost

Advertisement Copy - EXAD13.SRB

The Director.
It points the way to lower heating bills.

Kero-Sun never stops improving the kerosene heater. Our latest technological breakthrough: The Director. Not only is it portable, like all our heaters, but it swivels 60 degrees to beam heat where you want it.

Like all our Kero-Sun Portable Heaters, The Director also lets you set your central heating system low and heat only the room you're in to cut your fuel bills.

The Director has a stunning contemporary design. High output (rated at 11,700 BTU's per hour)-enough to keep a 24' x 18' living room cozy and warm. With up to 32 hours of burning time for just a few cents worth of kerosene an hour. And no smoke or odor during operation.

KERO-SUN
The good news in home heating.

Advertisement Copy - EXAD14.SRB

Unblended.
Unequaled.
Uncompromising.

That's how connoisseurs throughout the world describe the taste of unblended Glenfiddich Scotch Whisky.

Unblended Glenfiddich provides an unequaled taste experience no blended Scotch Whisky can match.

Glenfiddich is created from very expensive malted barley, in small hand-crafted copper pot stills. That is how Scotch was originally created about 400 years ago . . . a tradition that Glenfiddich maintains even today.

The result is a uniquely smooth, mellow taste unmatched by any blended Scotch Whisky.

GLENFIDDICH
Unblended Scotch Whisky

Advertisement Copy - EXAD15.SRB

Stilton
It's just crackers to be without it

Stilton, like all good English cheese, is a very good way of giving your taste buds a treat. Its close texture is marbled with a network of blue veins, and its rich creamy flavour lingers with every mouthful.

So, whether you try it simply with crackers, as a ploughman's at lunchtime, or as an after dinner delight, Stilton's unique flavour will drive your taste buds crackers.

Stilton. The King of English Cheese.

Advertisement Copy - EXAD16.SRB

Get Close to the Action . . .
With the Only Officially Licensed
NFL Binoculars

TASCO

TASCO Zip Focus binoculars bring you in focus instantly. They are lightweight and stylish. Fully coated quality optics, rubber fold down eyecups, for comfortable viewing with or without eyeglasses - TASCO'S finest for instant viewing! See the complete assortment of powers (zoom and fixed powers), and sizes, at leading stores everywhere.

TASCO quality optics.
We bring the world closer.

Advertisement Copy - EXAD17.SRB

Translating languages is just the beginning.
The revolutionary Craig M100.

We introduced the Craig M100 as an electronic language translator; an amazing hand-held interpreter that could translate as many as three languages simultaneously. But that was just the beginning. Because of advanced new technology the M100 opens the door to instant information on an incredible variety of subjects far beyond language translations.

Today, there are language capsules in French, German, Spanish, Italian and Japanese, even a new phonetic language pronunciation capsule. Next will be fascinating new capsules featuring Memory Improvement, First Aid, a Tax Guide and word games.

The Craig M100, with the exclusive Ami Memory System is the recognized standard for hand-held computers. There are virtually unlimited possibilities for storage of knowledge.

You must see a demonstration to believe it.
CRAIG M100

APPENDIX B
COMPUTER CONTROL PROGRAMS--STUDIES 1 AND 2

Computer Control Program - Study 1

```

999 REM -----Initialize Study-----
1000 PRINT CHR$(21);
1005 RANDOMIZE
1010 HOME
1020 D1$="DESIGN" * REM File with experimental design information.
1030 OPEN D1$+".VRB" FOR INPUT AS FILE VF1$(0)=7
1040 B=POS(VF1(0)," ",1)
1050 L1=VAL(SEG$(VF1(0),1,B-1))
1060 L2=VAL(SEG$(VF1(0),B+1,7))
1070 CLOSE VF1
1080 OPEN D1$+".VRB" FOR INPUT AS FILE VF1$(L1)=L2
1090 PRINT "Subject number (followed by <CR>);";
1100 INPUT S1$
1110 IF S1$="" THEN 9000
1120 S1=VAL(S1$)
1125 FOR I=1 TO S1*12 * Z9=RND * NEXT I
1130 IF S1>L1 THEN 9000 * REM Check that subject # is expected.
1140 D2$="RANDM1" * REM File with subject-to-treatment randomization.
1150 OPEN D2$+".VIN" FOR INPUT AS FILE VF2$(L1)
1160 S2=VF2(S1) * REM Pick treatment #S2 for subject #S1.
1170 CLOSE VF2
1180 H$=VF1(S2) * REM Record treatment information.
1190 CLOSE VF1
1200 IF S2<VAL(SEG$(H$,1,3)) THEN PRINT "Design file access error."
1300 G=VAL(SEG$(H$,5,5)) * REM Record goal condition.
1310 E=VAL(SEG$(H$,7,7)) * REM Record 10th position indicator.
1320 DIM Q1(2),A(12) * REM AD(position in sequence)=EXAD file number.
1330 FOR I=0 TO 2 * REM For each of the three test ad positions,
1340 P=POS(H$,"("+STR$(I),1) * REM Find treatment info. on H$.
1350 Q1(I)=VAL(SEG$(H$,P+4,P+4)) * REM Record # of execution at pos. I.
1360 A(I*2+3)=Q1(I)*3+1 * REM Index to 1,4,and 7 to pick EXAD file #
1361 REM for ads in sequence positions 3,5,and 7.
1370 C=VAL(SEG$(H$,P+2,P+2)) * REM Record context condition.
1380 IF C=0 THEN 1420 * REM If control, then assign no special context.
1390 IF E=C THEN P1=10 * REM Pick correct position for the ad which
1400 IF E<>C THEN P1=11 * REM will interfere with ad A(I*2+3).
1410 A(P1)=A(I*2+3)+C * REM Index to 2,3,or 5,6,or 8,9 to pick EXAD
1411 REM file # for ads in sequence positions 10 & 11.
1420 NEXT I
1430 D3$="RANDM2" * REM File with filler-ad randomization info.
1440 OPEN D3$+".VRB" FOR INPUT AS FILE VF3$(L1)=7
1450 R$=VF3(S2) * REM Record filler-ad randomization info.
1460 CLOSE VF3
1470 Z9=1
1480 FOR I=1 TO 12 * REM For each ad position except test positions,
1490 ON IGO TO 1500,1500,1520,1500,1520,1500,1520,1500,1500,1520,
1520,1500
1491 REM POSITION 1, 2, 3, 4, 5, 6, 7, 8, 9, 10,
11, 12
1500 A(I)=10+VAL(SEG$(R$,Z9,Z9)) * REM Randomly assign a filler EXAD

```

```

file #.
1510 Z9=Z9+1
1520 NEXT I
1521 REM --One EXAD file # should now be associated with each
      seq.position--
1525 DIM B1$(12) * REM Array for brand labels.
1530 OPEN "ADNAMS.VRB" FOR INPUT AS FILE VF4$(0)=7
1540 B=POS(VF4(0)," ",1)
1550 L5=VAL(SEG$(VF4(0),1,B-1))
1560 L6=VAL(SEG$(VF4(0),B+1,7))
1570 CLOSE VF4
1580 OPEN "ADNAMS.VRB" FOR INPUT AS FILE VF4$(L5)=L6
1590 FOR I=1 TO 12
1600 B1$(I)=VF4(A(I)) * REM Read in brand labels for each seq.position.
1610 NEXT I
1620 CLOSE VF4
1640 IF G=2 THEN 1700 * REM Pick appropriate question for goal.
1650 Q3$="How likely would you be to purchase"
1655 Q4$=""
1660 REM      +-----+-----+-----+-----+
1670 Q1$="      Very          50/50          Very"
1680 Q2$="    Unlikely          Chance          Likely"
1690 GO TO 1750
1700 Q3$="Compared to most ads you are familiar with, how interesting"
1705 Q4$="was the ad for "
1710 REM      +-----+-----+-----+-----+
1720 Q1$="      Very          Average          Very"
1730 Q2$="Uninteresting          Interesting"
1750 DIM R2(3)
1760 D4$="RANDM3" * REM File with recall-question order random. info.
1770 OPEN D4$+".VRB" FOR INPUT AS FILE VF5$(L1)=7
1780 R1$=VF5(S2) * REM Record question order randomization info.
1790 CLOSE VF5
1795 R3$=""
1800 FOR I=1 TO 3 * REM For recall-question positions 1 to 3,
1810 R2(I)=VAL(SEG$(R1$,I,I)) * REM Assign a test ad.
1820 R3$=R3$+STR$(Q1(R2(I)-1)) * REM Record execution# at
      ques.position I.
1830 NEXT I
2000 HOME
2005 PRINT CHR$(14); * REM Turn reverse video on.
2010 CURS(24,26) * PRINT CHR$(27);"[2K";
2020 PRINT "Press <SPACE BAR> to begin.";
2025 PRINT CHR$(15); * REM Turn reverse video off.
2030 FLSH
2040 Z9=SYS(4)
2050 IF Z9<>32 THEN 2040
2055 POKE(-28,0) * REM Blank display.
2060 HOME
2070 REM -----BEGIN EXPERIMENT-----
2075 REM
2080 REM -----Print Instructions-----
2090 OPEN "INSTR"+STR$(G)+".SRB" FOR INPUT AS FILE #1
2100 IF END #1 THEN 2140

```

```

2110 INPUT #1,Z$
2120 PRINT #0,Z$
2130 GO TO 2100
2140 CLOSE #1
2145 PRINT CHR$(14); * REM Turn reverse video on.
2150 CURS(24,25) * PRINT CHR$(27);"[2K";
2155 PRINT "Press <SPACE BAR> to continue.";
2160 PRINT CHR$(15); * REM Turn reverse video off.
2165 POKE(-28,7) * REM Unblank display.
2170 FLSH
2180 Z9=SYS(4)
2190 IF Z9<>32 THEN 2180
2192 Z9=SYS(8) * REM Disable ETX.
2195 POKE(-28,0) * REM Blank display.
2200 HOME
2205 PRINT
2210 PRINT TAB(10);"Ask the experimenter to demonstrate the use of the
keyboard"
2215 PRINT TAB(13);"at this time using the example question printed
below."
2217 FOR I=1 TO 79 * PRINT "-"; * NEXT I
2220 BI$(0)="Coca Cola" * REM Product used in example.
2225 I=0 * REM Set I to 0 to cause return from GOSUB.
2229 GOSUB 2500 * REM Print an example of the judgment scale.
2230 POKE(-28,0) * REM Blank display.
2240 HOME
2245 CURS(4,6)
2246 PRINT "If you have any questions at this time, please ask the
experimenter."
2250 PRINT CHR$(14); * REM Turn reverse video on.
2255 CURS(24,16) * PRINT CHR$(27);"[2K";
2260 PRINT "Press <SPACE BAR> when ready to review first ad.";
2265 PRINT CHR$(15); * REM Turn reverse video off.
2270 POKE(-28,7) * REM Unblank display.
2275 FLSH
2280 Z9=SYS(4)
2285 IF Z9<>32 THEN 2280
2290 DIM T3(12),T4(12) * REM Arrays for inspection & response times.
2295 DIM X1(12) * REM Array for ad ratings.
2296 REM
2300 FOR I=1 TO 12 * REM For each sequence position,
2305 POKE(-28,0) * REM Blank display.
2310 HOME
2315 REM -----Print Advertisement-----
2320 OPEN "EXAD"+STR$(A(I))+".SRB" FOR INPUT AS FILE #2
2330 IF END #2 THEN 2370
2340 INPUT #2,Z$
2350 PRINT #0,TAB(7);Z$
2360 GO TO 2330
2370 CLOSE #2
2375 PRINT CHR$(14); * REM Turn reverse video on.
2380 CURS(24,25) * PRINT CHR$(27);"[2K";
2385 PRINT "Press <SPACE BAR> to continue.";
2390 PRINT CHR$(15); * REM Turn reverse video off.

```

```

2395 POKE(-28,7) * REM Unblank display.
2400 FLISH
2410 TIME(Z1,Z2,Z3,Z4)
2420 T1=3600*Z1+60*Z2+Z3+(Z4/60) * REM Record time in seconds.
2430 Z9=SYS(4)
2440 IF Z9<>32 THEN 2430
2450 TIME(Z1,Z2,Z3,Z4)
2460 T2=3600*Z1+60*Z2+Z3+(Z4/60)
2465 T3(I)=T2-T1 * REM Store ad review time (in sec.).
2468 POKE(-28,0) * REM Blank display.
2470 HOME
2480 REM -----Ask for Judgment-----
2500 Z9=SYS(1) * REM Disable keyboard echoing.
2590 PRINT CHR$(14); * REM Turn on reverse video.
2600 CURS(22,1) * PRINT CHR$(27);"[J";
2620 CURS(22,4) * PRINT "Press 'Z' to";
2630 CURS(22,31) * PRINT "Press <SPACE BAR>";
2640 CURS(22,65) * PRINT "Press '/' to";
2650 CURS(23,2) * PRINT "move cursor left";
2660 CURS(23,33) * PRINT "to mark answer";
2670 CURS(23,63) * PRINT "move cursor right";
2680 CURS(24,7) * PRINT "<----";
2690 CURS(24,69) * PRINT "---->";
2695 PRINT CHR$(15); * REM Turn off reverse video.
2700 CURS(11,20)
2710 FOR J=1 TO 8 * PRINT "+----"; * NEXT J * PRINT "+";
2720 CURS(12,15) * PRINT Q1$;
2730 CURS(13,15) * PRINT Q2$;
2740 REM Center question.
2750 CURS(7,40-INT(LEN(Q3$)/2)) * PRINT Q3$;
2760 CURS(8,40-INT((1+LEN(Q4$+B1$(I))/2)) * PRINT Q4$+B1$(I)+"?";
2770 V4=1+INT(RND*2)*78 * REM Pick cursor starting position.
2780 IF V4>79 THEN 2770
2790 P2=V4-20 * REM Set relative cursor position.
2800 TIME(Z1,Z2,Z3,Z4)
2810 T1=3600*Z1+60*Z2+Z3+(Z4/60)
2820 PRINT CHR$(22); * REM Turn cursor on.
2825 POKE(-28,7) * REM Unblank display.
2830 CURS(10,P2+20) * REM Position cursor.
2850 FLISH
2860 P3=SYS(4) * REM Check keyboard for command.
2870 IF P3<>32 THEN IF P3<>90 THEN IF P3<>47 THEN 2850
2880 IF P3=32 THEN 2960 * REM Check for "mark" response.
2890 IF P3=47 THEN 2930 * REM Check for move right.
2900 IF P2<=-19 THEN 2850 * REM Check legality of move left.
2910 P2=P2-1 * REM Move cursor left.
2920 GO TO 2830
2930 IF P2>=59 THEN 2850 * REM Check legality of move right.
2940 P2=P2+1 * REM Move cursor right.
2950 GO TO 2830
2960 IF P2<0 THEN 2850 * REM Make sure response is on scale.
2970 IF P2>40 THEN 2850
2980 X1(I)=1+P2*.2 * REM Scale response as 1 to 9.
2990 TIME(Z1,Z2,Z3,Z4)

```

```

3000 T2=3600*Z1+60*Z2+Z3+(Z4/60)
3010 T4(I)=T2-T1 * REM Store response latency (in sec.).
3020 PRINT CHR$(21); * REM Turn cursor off.
3030 CURS(11,P2+20) * PRINT "X";
3040 SHOW(120)
3050 Z9=SYS(4)
3055 Z9=SYS(2) * REM Reenable keyboard echoing.
3057 IF I=0 THEN RETURN
3060 NEXT I * REM Print next ad in sequence.
3980 POKE(-28,0) * REM Blank display.
3990 HOME
4000 REM -----Administer "Media Involvement" Questionnaire-----
4100 OPEN "INSTR3.SRB" FOR INPUT AS FILE #2
4110 IF END #2 THEN 4150
4120 INPUT #2,Z$
4130 PRINT #0,Z$
4140 GO TO 4110
4150 CLOSE #2
4160 PRINT
4170 PRINT TAB(15);"Your 'Project ID Number' is ";
4174 REM (treatment#)-(subject#)-(execution#)-(original position#s)
4175 PRINT STR$(S2)+"-"+S1$+"-"+R3$+"-"+R1$
4180 PRINT TAB(15);"PLEASE RECORD THIS NUMBER ON YOUR QUESTIONNAIRE.";
4200 PRINT CHR$(14); * REM Turn reverse video on.
4210 CURS(24,15) * PRINT CHR$(27);"[2K";
4220 PRINT "Press <SPACE BAR> after completing questionnaire.";
4230 PRINT CHR$(15); * REM Turn reverse video off.
4240 POKE(-28,7) * REM Unblank display.
4242 TIME(Z1,Z2,Z3,Z4)
4245 T1=3600*Z1+60*Z2+Z3+(Z4/60)
4250 FLSH
4260 Z9=SYS(4)
4270 IF Z9<>32 THEN 4260
4280 TIME(Z1,Z2,Z3,Z4)
4290 T2=3600*Z1+60*Z2+Z3+(Z4/60)
4300 T3(0)=T2-T1 * REM Record questionnaire completion time.
5000 POKE(-28,0) * REM Blank display.
5010 HOME
5020 REM -----Administer Recall Task-----
5030 OPEN "INSTR4.SRB" FOR INPUT AS FILE #3
5040 IF END #3 THEN 5080
5050 INPUT #3,Z$
5060 PRINT #0,Z$
5070 GO TO 5040
5080 CLOSE #3
5090 PRINT CHR$(14); * REM Turn reverse video on.
5100 CURS(24,19) * PRINT CHR$(27);"[2K";
5110 PRINT "Press <SPACE BAR> when recorder is ready.";
5120 PRINT CHR$(15); * REM Turn reverse video off.
5130 POKE(-28,7) * REM Unblank display.
5135 TIME(Z1,Z2,Z3,Z4)
5137 T1=3600*Z1+60*Z2+Z3+(Z4/60)
5140 FLSH
5150 Z9=SYS(4)

```

```

5160 IF Z9<>32 THEN 5150
5162 TIME(Z1,Z2,Z3,Z4)
5165 T2=3600*Z1+60*Z2+Z3+(Z4/60)
5167 T4(0)=T2-T1 * REM Record recall-test instruction review time.
5170 FOR I=1 TO 3 * REM For recall-questions 1 to 3,
5180 POKE(-28,0) * REM Blank display.
5190 HOME
5195 REM -----Print Clock-----
5200 PRINT CHR$(14); * REM Turn on reverse video.
5210 CURS(1,33) * PRINT CHR$(27);"[K";
5220 CURS(2,33) * PRINT CHR$(27);"[K";
5230 CURS(10,33) * PRINT CHR$(27);"[K";
5240 CURS(11,33) * PRINT CHR$(27);"[K";
5250 FOR K=3 TO 9
5260 CURS(K,1) * PRINT TAB(5);
5270 CURS(K,28) * PRINT TAB(32);
5280 NEXT K
5290 CURS(2,3) * PRINT '105";TAB(14);'120";TAB(27);'15";
5300 CURS(6,3) * PRINT '90"; * CURS(6,28) * PRINT '30";
5310 CURS(10,3) * PRINT '75";TAB(15);'60";TAB(27);'45";
5320 CURS(24,25) * PRINT CHR$(27);"[2K";
5330 PRINT "Press <SPACE BAR> when ready.";
5340 PRINT CHR$(15); * REM Turn off reverse video.
5350 CURS(5,15) * PRINT "TIME";
5360 CURS(7,13) * PRINT "REMAINING";
5370 REM ----- End Clock -----
5380 CURS(16,17)
5390 PRINT "Please try to remember everything you can about";
5400 CURS(17,17)
5410 PRINT "_____";
5490 POKE(-28,7) * REM Unblank display.
5500 FLSH
5510 Z9=SYS(4) * REM Wait for subject ready signal.
5520 IF Z9<>32 THEN 5510
5525 PRINT CHR$(7);
5530 CURS(17,40-INT(LEN(B1$(R2(I)*2+1))/2)) * REM Center item.
5535 PRINT B1$(R2(I)*2+1);
5540 CURS(24,1) * PRINT CHR$(27);"[2K";
5600 FOR K=1 TO 40 * REM For 40 3-second intervals,
5610 SHOW(172) * REM Wait 3 seconds (corrected).
5620 Z9=SYS(4)
5630 IF K<6 THEN A=1
5640 IF K<6 THEN B=18-K*3
5650 IF K>5 THEN IF K<16 THEN A=K-5
5660 IF K>5 THEN IF K<16 THEN B=1
5670 IF K>15 THEN IF K<26 THEN A=11
5680 IF K>15 THEN IF K<26 THEN B=K*3-47
5690 IF K>25 THEN IF K<36 THEN A=37-K
5700 IF K>25 THEN IF K<36 THEN B=31
5710 IF K>35 THEN A=1
5720 IF K>35 THEN B=138-K*3
5730 CURS(A,B) * REM Increment clock.
5740 IF A>1 THEN IF A<11 THEN PRINT " ";
5750 IF A=1 THEN PRINT " ";

```

```

5760 IF A=11 THEN PRINT "  ";
5770 NEXT K
5780 PRINT CHR$(7); @ REM Ring bell.
6000 NEXT I
6010 REM -----End of Recall Task-----
6020 POKE(-28,0) @ REM Blank display.
6030 HOME
6040 CURS(2,19) @ PRINT "*****";
6050 CURS(3,19) @ PRINT " *      Thank you for your participation      *";
6060 CURS(4,19) @ PRINT " *      in this study. The experimenter      *";
6070 CURS(5,19) @ PRINT " * will now answer any of your questions, *";
6080 CURS(6,19) @ PRINT " *      and issue the experimental credit.  *";
6090 CURS(7,19) @ PRINT "*****";
6100 POKE(-28,7) @ REM Unblank display.
7000 REM -----Output Data-----
7010 OPEN "SCRTCH.SRB" FOR OUTPUT AS FILE #4, FILESIZE (2)
7020 PRINT #4,H$+" ";
7030 FOR I=1 TO 12
7040 IF I=7 THEN PRINT #4
7050 IF I=7 THEN PRINT #4,SEG$(H$,1,3)+" ";
7060 PRINT #4,USING "-##-##-#",T3(I),T4(I),X1(I)*10;
7070 NEXT I
7080 PRINT #4,USING " -##-## -##",T3(0),T4(0),S1;
7090 PRINT #4,"-"+R3$+"-"+R1$+"/"+R$
7100 CLOSE
7110 OPEN "SCRTCH.SRB" FOR INPUT AS FILE #4
7120 OPEN "RWDATA.VRB" FOR INPUT AS FILE VF6$(L1*2)=80
7130 INPUT #4,Z$
7140 VF6(S2*2-1)=Z$
7150 INPUT #4,Z$
7160 VF6(S2*2)=Z$
7170 CLOSE
7180 KILL "SCRTCH.SRB"
7190 Z9=SYS(7) @ REM Reenable ETX.
8000 CHAIN "STUDY.BRB"
9000 CLOSE
9010 PRINT CHR$(22);
9999 END

```

Computer Control Program - Study 2

```

999 REM -----Initialize Study-----
1000 PRINT CHR$(21);
1005 RANDOMIZE
1010 HOME
1020 D1$="DESIGN" * REM File with experimental design information.
1030 OPEN D1$+".VRB" FOR INPUT AS FILE VF1$(0)=7
1040 B=POS(VF1(0)," ",1)
1050 L1=VAL(SEG$(VF1(0),1,B-1))
1060 L2=VAL(SEG$(VF1(0),B+1,7))
1070 CLOSE VF1
1080 OPEN D1$+".VRB" FOR INPUT AS FILE VF1$(L1)=L2
1090 PRINT "Subject number (followed by <CR>);";
1100 INPUT S1$
1110 IF S1$="" THEN 9000
1120 S1=VAL(S1$)
1125 FOR I=1 TO S1*12 * Z9=RND * NEXT I
1130 IF S1>L1 THEN 9000 * REM Check that subject # is expected.
1140 D2$="RANDM1" * REM File with subject-to-treatment randomization.
1150 OPEN D2$+".VIN" FOR INPUT AS FILE VF2$(L1)
1160 S2=VF2$(S1) * REM Pick treatment #S2 for subject #S1.
1170 CLOSE VF2
1180 H$=VF1$(S2) * REM Record treatment information.
1190 CLOSE VF1
1200 IF S2<>VAL(SEG$(H$,1,3)) THEN PRINT "Design file access
error."
1300 G=VAL(SEG$(H$,5,5)) * REM Record goal condition.
1310 E=VAL(SEG$(H$,7,7)) * REM Record 10th position indicator.
1320 DIM Q1(2),A(12) * REM AD(position in sequence)=EXAD file
number.
1330 FOR I=0 TO 2 * REM For each of the three test ad positions,
1340 P=POS(H$,"( "+STR$(I),1) * REM Find treatment info. on H$.
1350 Q1(I)=VAL(SEG$(H$,P+4,P+4)) * REM Record # of execution at
pos. I.
1360 A(I*2+3)=Q1(I)*3+1 * REM Index to 1,4,and 7 to pick EXAD
file #
1361 REM for ads in sequence positions 3,5,and 7.
1370 C=VAL(SEG$(H$,P+2,P+2)) * REM Record context condition.
1380 IF C=0 THEN 1420 * REM If control, then assign no special
context.
1390 IF E=C THEN P1=10 * REM Pick correct position for the ad
which
1400 IF E<>C THEN P1=11 * REM will interfere with ad A(I*2+3).
1410 A(P1)=A(I*2+3)+C * REM Index to 2,3,or 5,6,or 8,9 to pick EXAD
1411 REM file # for ads in sequence positions 10 & 11.
1420 NEXT I
1430 D3$="RANDM2" * REM File with filler-ad randomization info.
1440 OPEN D3$+".VRB" FOR INPUT AS FILE VF3$(L1)=7
1450 R$=VF3$(S2) * REM Record filler-ad randomization info.
1460 CLOSE VF3
1470 Z9=1

```

```

1480 FOR I=1 TO 12 * REM For each ad position except test positions,
1490 ON IGO TO 1500,1500,1520,1500,1520,1500,1520,1500,1500,1520,
    1520,1500
1491 REM POSITION 1,  2,  3,  4,  5,  6,  7,  8,  9, 10,
    11, 12
1500 A(I)=10+VAL(SEG$(R$,Z9,Z9)) * REM Randomly assign a filler EXAD
    file #.
1510 Z9=Z9+1
1520 NEXT I
1521 REM --One EXAD file # should now be associated with each
    seq.position--
1525 DIM B1$(12) * REM Array for brand labels.
1530 OPEN "ADNAMS.VRB" FOR INPUT AS FILE VF4$(0)=7
1540 B=POS(VF4(0)," ",1)
1550 L5=VAL(SEG$(VF4(0),1,B-1))
1560 L6=VAL(SEG$(VF4(0),B+1,7))
1570 CLOSE VF4
1580 OPEN "ADNAMS.VRB" FOR INPUT AS FILE VF4$(L5)=L6
1590 FOR I=1 TO 12
1600 B1$(I)=VF4(A(I)) * REM Read in brand labels for each
    seq.position.
1610 NEXT I
1620 CLOSE VF4
1640 IF G=2 THEN 1700 * REM Pick appropriate question for goal.
1650 Q3$="How likely would you be to purchase"
1655 Q4$=""
1660 REM      +-----+-----+-----+-----+-----+-----+
1670 Q1$="      Very                        50/50                        Very"
1680 Q2$="      Unlikely                    Chance                        Likely"
1690 GO TO 1750
1700 Q3$="Compared to most ads you are familiar with, how"
1705 Q4$="interesting was the ad for "
1710 REM      +-----+-----+-----+-----+-----+-----+
1720 Q1$="      Very                        Average                        Very"
1730 Q2$="Uninteresting                    Interesting"
1750 DIM R2(3)
1760 D4$="RANDM3" * REM File with recall-question order random. info.
1770 OPEN D4$+".VRB" FOR INPUT AS FILE VF5$(L1)=7
1780 R1$=VF5(S2) * REM Record question order randomization info.
1790 CLOSE VF5
1795 R3$=""
1800 FOR I=1 TO 3 * REM For recall-question positions 1 to 3,
1810 R2(I)=VAL(SEG$(R1$,I,I)) * REM Assign a test ad.
1820 R3$=R3$+STR$(Q1(R2(I)-1)) * REM Record execution# at
    ques.position I.
1830 NEXT I
2000 HOME
2005 PRINT CHR$(14); * REM Turn reverse video on.
2010 CURS(24,26) * PRINT CHR$(27);"[2K";
2020 PRINT "Press <SPACE BAR> to begin.";
2025 PRINT CHR$(15); * REM Turn reverse video off.
2030 FLSH
2040 Z9=SYS(4)
2050 IF Z9<>32 THEN 2040

```

```

2055 POKE(-28,0) * REM Blank display.
2060 HOME
2070 REM -----BEGIN EXPERIMENT-----
2075 REM
2080 REM -----Print Instructions-----
2090 OPEN "INSTR"+STR$(G)+"$.SRB" FOR INPUT AS FILE #1
2100 IF END #1 THEN 2140
2110 INPUT #1,Z$
2120 PRINT #0,Z$
2130 GO TO 2100
2140 CLOSE #1
2145 PRINT CHR$(14); * REM Turn reverse video on.
2150 CURS(24,25) * PRINT CHR$(27);"[2K";
2155 PRINT "Press <SPACE BAR> to continue.";
2160 PRINT CHR$(15); * REM Turn reverse video off.
2165 POKE(-28,7) * REM Unblank display.
2170 FLISH
2180 Z9=SYS(4)
2190 IF Z9<>32 THEN 2180
2192 Z9=SYS(8) * REM Disable ETX.
2195 POKE(-28,0) * REM Blank display.
2200 HOME
2205 PRINT
2210 PRINT TAB(10);"Ask the experimenter to demonstrate the use of
the keyboard"
2215 PRINT TAB(13);"at this time using the example question printed
below."
2217 FOR I=1 TO 79 * PRINT "-"; * NEXT I
2220 B1$(0)="Coca Cola" * REM Product used in example.
2225 I=0 * REM Set I to 0 to cause return from GOSUB.
2229 GOSUB 2500 * REM Print an example of the judgment scale.
2230 POKE(-28,0) * REM Blank display.
2240 HOME
2245 CURS(4,6)
2246 PRINT "If you have any questions at this time, please ask
the experimenter."
2250 PRINT CHR$(14); * REM Turn reverse video on.
2255 CURS(24,16) * PRINT CHR$(27);"[2K";
2260 PRINT "Press <SPACE BAR> when ready to review first ad.";
2265 PRINT CHR$(15); * REM Turn reverse video off.
2270 POKE(-28,7) * REM Unblank display.
2275 FLISH
2280 Z9=SYS(4)
2285 IF Z9<>32 THEN 2280
2290 DIM T3(12),T4(12) * REM Arrays for inspection & response times.
2295 DIM X1(12) * REM Array for ad ratings.
2296 REM
2300 FOR I=12 TO 1 STEP -1 * REM For each sequence position,
2305 POKE(-28,0) * REM Blank display.
2310 HOME
2315 REM -----Print Advertisement-----
2320 OPEN "EXAD"+STR$(A(I))+".SRB" FOR INPUT AS FILE #2
2330 IF END #2 THEN 2370
2340 INPUT #2,Z$

```

```

2350 PRINT #0,TAB(7);Z$
2360 GO TO 2330
2370 CLOSE #2
2375 PRINT CHR$(14); * REM Turn reverse video on.
2380 CURS(24,25) * PRINT CHR$(27);"[2K";
2385 PRINT "Press <SPACE BAR> to continue.";
2390 PRINT CHR$(15); * REM Turn reverse video off.
2395 POKE(-28,7) * REM Unblank display.
2400 FLSH
2410 TIME(Z1,Z2,Z3,Z4)
2420 T1=3600*Z1+60*Z2+Z3+(Z4/60) * REM Record time in seconds.
2430 Z9=SYS(4)
2440 IF Z9<>32 THEN 2430
2450 TIME(Z1,Z2,Z3,Z4)
2460 T2=3600*Z1+60*Z2+Z3+(Z4/60)
2465 T3(I)=T2-T1 * REM Store ad review time (in sec.).
2468 POKE(-28,0) * REM Blank display.
2470 HOME
2480 REM -----Ask for Judgment-----
2500 Z9=SYS(1) * REM Disable keyboard echoing.
2590 PRINT CHR$(14); * REM Turn on reverse video.
2600 CURS(22,1) * PRINT CHR$(27);"[J";
2620 CURS(22,4) * PRINT "Press 'Z' to";
2630 CURS(22,31) * PRINT "Press <SPACE BAR>";
2640 CURS(22,65) * PRINT "Press '/' to";
2650 CURS(23,2) * PRINT "move cursor left";
2660 CURS(23,33) * PRINT "to mark answer";
2670 CURS(23,63) * PRINT "move cursor right";
2680 CURS(24,7) * PRINT "<----";
2690 CURS(24,69) * PRINT "---->";
2695 PRINT CHR$(15); * REM Turn off reverse video.
2700 CURS(11,20)
2710 FOR J=1 TO 8 * PRINT "+----"; * NEXT J * PRINT "+";
2720 CURS(12,15) * PRINT Q1$;
2730 CURS(13,15) * PRINT Q2$;
2740 REM Center question.
2750 CURS(7,40-INT(LEN(Q3$)/2)) * PRINT Q3$;
2760 CURS(8,40-INT((1+LEN(Q4$+B1$(I)))/2)) * PRINT Q4$+B1$(I)+"?";
2770 V4=1+INT(RND*2)*78 * REM Pick cursor starting position.
2780 IF V4>79 THEN 2770
2790 P2=V4-20 * REM Set relative cursor position.
2800 TIME(Z1,Z2,Z3,Z4)
2810 T1=3600*Z1+60*Z2+Z3+(Z4/60)
2820 PRINT CHR$(22); * REM Turn cursor on.
2825 POKE(-28,7) * REM Unblank display.
2830 CURS(10,P2+20) * REM Position cursor.
2850 FLSH
2860 P3=SYS(4) * REM Check keyboard for command.
2870 IF P3<>32 THEN IF P3<>90 THEN IF P3<>47 THEN 2850
2880 IF P3=32 THEN 2960 * REM Check for "mark" response.
2890 IF P3=47 THEN 2930 * REM Check for move right.
2900 IF P2<=-19 THEN 2850 * REM Check legality of move left.
2910 P2=P2-1 * REM Move cursor left.
2920 GO TO 2830

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2930 IF P2>=59 THEN 2850 * REM Check legality of move right.
2940 P2=P2+1 * REM Move cursor right.
2950 GO TO 2830
2960 IF P2<0 THEN 2850 * REM Make sure response is on scale.
2970 IF P2>40 THEN 2850
2980 X1(I)=1+P2*.2 * REM Scale response as 1 to 9.
2990 TIME(Z1,Z2,Z3,Z4)
3000 T2=3600*Z1+60*Z2+Z3+(Z4/60)
3010 T4(I)=T2-T1 * REM Store response latency (in sec.).
3020 PRINT CHR$(21); * REM Turn cursor off.
3030 CURS(11,P2+20) * PRINT "X";
3040 SHOW(120)
3050 Z9=SYS(4)
3055 Z9=SYS(2) * REM Reenable keyboard echoing.
3057 IF I=0 THEN RETURN
3060 NEXT I * REM Print next ad in sequence.
3980 POKE(-28,0) * REM Blank display.
3990 HOME
4000 REM -----Administer "Media Involvement" Questionnaire-----
4100 OPEN "INSTR3.SRB" FOR INPUT AS FILE #2
4110 IF END #2 THEN 4150
4120 INPUT #2,Z$
4130 PRINT #0,Z$
4140 GO TO 4110
4150 CLOSE #2
4160 PRINT
4170 PRINT TAB(15);"Your 'Project ID Number' is ";
4174 REM (treatment#)-(subject#)-(execution#s)-(original position#s)
4175 PRINT STR$(S2)+"-"+S1$+"-"+R3$+"-"+R1$
4180 PRINT TAB(15);"PLEASE RECORD THIS NUMBER ON YOUR QUESTIONNAIRE.";
4200 PRINT CHR$(14); * REM Turn reverse video on.
4210 CURS(24,15) * PRINT CHR$(27);"[2K";
4220 PRINT "Press <SPACE BAR> after completing questionnaire.";
4230 PRINT CHR$(15); * REM Turn reverse video off.
4240 POKE(-28,7) * REM Unblank display.
4242 TIME(Z1,Z2,Z3,Z4)
4245 T1=3600*Z1+60*Z2+Z3+(Z4/60)
4250 FLSH
4260 Z9=SYS(4)
4270 IF Z9<>32 THEN 4260
4280 TIME(Z1,Z2,Z3,Z4)
4290 T2=3600*Z1+60*Z2+Z3+(Z4/60)
4300 T3(0)=T2-T1 * REM Record questionnaire completion time.
5000 POKE(-28,0) * REM Blank display.
5010 HOME
5020 REM -----Administer Recall Task-----
5030 OPEN "INSTR4.SRB" FOR INPUT AS FILE #3
5040 IF END #3 THEN 5080
5050 INPUT #3,Z$
5060 PRINT #0,Z$
5070 GO TO 5040
5080 CLOSE #3
5090 PRINT CHR$(14); * REM Turn reverse video on.
5100 CURS(24,19) * PRINT CHR$(27);"[2K";

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5110 PRINT "Press <SPACE BAR> when recorder is ready.";
5120 PRINT CHR$(15); * REM Turn reverse video off.
5130 POKE(-28,7) * REM Unblank display.
5135 TIME(Z1,Z2,Z3,Z4)
5137 T1=3600*Z1+60*Z2+Z3+(Z4/60)
5140 FLSH
5150 Z9=SYS(4)
5160 IF Z9<>32 THEN 5150
5162 TIME(Z1,Z2,Z3,Z4)
5165 T2=3600*Z1+60*Z2+Z3+(Z4/60)
5167 T4(0)=T2-T1 * REM Record recall-test instruction review time.
5170 FOR I=1 TO 3 * REM For recall-questions 1 to 3,
5180 POKE(-28,0) * REM Blank display.
5190 HOME
5195 REM -----Print Clock-----
5200 PRINT CHR$(14); * REM Turn on reverse video.
5210 CURS(1,33) * PRINT CHR$(27);"[1K";
5220 CURS(2,33) * PRINT CHR$(27);"[1K";
5230 CURS(10,33) * PRINT CHR$(27);"[1K";
5240 CURS(11,33) * PRINT CHR$(27);"[1K";
5250 FOR K=3 TO 9
5260 CURS(K,1) * PRINT TAB(5);
5270 CURS(K,28) * PRINT TAB(32);
5280 NEXT K
5290 CURS(2,3) * PRINT '105";TAB(14);'120";TAB(27);'15";
5300 CURS(6,3) * PRINT '90"; * CURS(6,28) * PRINT '30";
5310 CURS(10,3) * PRINT '75";TAB(15);'60";TAB(27);'45";
5320 CURS(24,25) * PRINT CHR$(27);"[2K";
5330 PRINT "Press <SPACE BAR> when ready.";
5340 PRINT CHR$(15); * REM Turn off reverse video.
5350 CURS(5,15) * PRINT "TIME";
5360 CURS(7,13) * PRINT "REMAINING";
5370 REM ----- End Clock -----
5380 CURS(16,17)
5390 PRINT "Please try to remember everything you can about";
5400 CURS(17,17)
5410 PRINT "_____";
5490 POKE(-28,7) * REM Unblank display.
5500 FLSH
5510 Z9=SYS(4) * REM Wait for subject ready signal.
5520 IF Z9<>32 THEN 5510
5525 PRINT CHR$(7);
5530 CURS(17,40-INT((LEN(B1$(R2(I)*2+1))/2)) * REM Center item.
5535 PRINT B1$(R2(I)*2+1);
5540 CURS(24,1) * PRINT CHR$(27);"[2K";
5600 FOR K=1 TO 40 * REM For 40 3-second intervals,
5610 SHOW(172) * REM Wait 3 seconds (corrected).
5620 Z9=SYS(4)
5630 IF K<6 THEN A=1
5640 IF K<6 THEN B=18-K*3
5650 IF K>5 THEN IF K<16 THEN A=K-5
5660 IF K>5 THEN IF K<16 THEN B=1
5670 IF K>15 THEN IF K<26 THEN A=11
5680 IF K>15 THEN IF K<26 THEN B=K*3-47

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5690 IF K>25 THEN IF K<36 THEN A=37-K
5700 IF K>25 THEN IF K<36 THEN B=31
5710 IF K>35 THEN A=1
5720 IF K>35 THEN B=138-K*3
5730 CURS(A,B) * REM Increment clock.
5740 IF A>1 THEN IF A<11 THEN PRINT "  ";
5750 IF A=1 THEN PRINT "  ";
5760 IF A=11 THEN PRINT "  ";
5770 NEXT K
5780 PRINT CHR$(7); * REM Ring bell.
6000 NEXT I
6010 REM -----End of Recall Task-----
6020 POKE(-28,0) * REM Blank display.
6030 HOME
6040 CURS(2,19) * PRINT "*****";
6050 CURS(3,19) * PRINT "*      Thank you for your participation      *";
6060 CURS(4,19) * PRINT "*      in this study. The experimenter      *";
6070 CURS(5,19) * PRINT "* will now answer any of your questions, *";
6080 CURS(6,19) * PRINT "*      and issue the experimental credit.  *";
6090 CURS(7,19) * PRINT "*****";
6100 POKE(-28,7) * REM Unblank display.
7000 REM -----Output Data-----
7010 OPEN "SCRTCH.SRB" FOR OUTPUT AS FILE #4, FILESIZE (2)
7020 PRINT #4,H$+" ";
7030 FOR I=1 TO 12
7040 IF I=7 THEN PRINT #4
7050 IF I=7 THEN PRINT #4,SEG$(H$,1,3)+" ";
7060 PRINT #4,USING "-##-##-##",T3(I),T4(I),X1(I)*10;
7070 NEXT I
7080 PRINT #4,USING " -##-## -##",T3(0),T4(0),S1;
7090 PRINT #4,"-"+R3$+"-"+R1$+"/"+R$
7100 CLOSE
7110 OPEN "SCRTCH.SRB" FOR INPUT AS FILE #4
7120 OPEN "RWDATA.VRB" FOR INPUT AS FILE VF6$(L1*2)=80
7130 INPUT #4,Z$
7140 VF6$(S2*2-1)=Z$
7150 INPUT #4,Z$
7160 VF6$(S2*2)=Z$
7170 CLOSE
7180 KILL "SCRTCH.SRB"
7190 Z9=SYS(7) * REM Reenable ETX.
8000 CHAIN "STUDY.BRB"
9000 CLOSE
9010 PRINT CHR$(22);
9999 END

```

APPENDIX C
EXPERIMENTAL MATERIALS--STUDY 3

Form 1 - Experimenter Instructions

EXPERIMENTER INSTRUCTIONS FOR EXPERIMENT # 82-26(IE3) (Bryan Hall, Room 302)

BEFORE THE SUBJECT COMES . . .

- (1) Turn the computer on by pushing the rocker switch up to the middle position.
- (2) Open the disk drive door and push in the disk until it clicks.
- (3) Close the disk drive door.
- (4) Type in RUN FORTH and then hit <RETURN>.

Wait for the computer to type the number sign (#).
Then type EXPER DISK 0 LOAD and then hit <RETURN>.

- (5) Now, go outside and look for a subject for EXP #82-26.

If the subject doesn't show up within 10 minutes of the appointed time, and this is the last subject you are running, go to the section labeled "WHEN THE SUBJECT IS GONE."

WHEN THE SUBJECT IS IN THE ROOM . . .

- (6) Ask the subject to fill out and sign one copy of the "Informed Consent Form."
- (7) While the subject is doing this, check to be sure that the slide projector is turned on and the slide tray is positioned at zero. THE SLIDES MUST BE IN THE CORRECT SEQUENCE. The slide sequence changes for every subject whose Project ID Number is odd.
- (8) If the subject decides to participate, ask him/her to fill out the "Product-Class Familiarity Questionnaire."
- (9) While the subject is doing this, type the word STUDY into the computer and then hit <RETURN>. The computer will automatically load and run the experiment program. The computer will then ask for a subject number.
- (10) Check off the next unchecked space on the "Run Card." Then, enter the corresponding Subject Number, Product-

Class Number, Repetition Level, and Competition Level into the computer.

- (11) When the subject is done with the familiarity questionnaire, seat him/her at the computer terminal and ask him/her to read the instructions on the display screen. Please tell the subject that he/she will be looking at a number of advertisements on the projection screen, rating each of them on interest value or appeal. When the subject is done, he/she will be asked by the computer to fill out the "Media Involvement Questionnaire." Then, he/she will be asked by the computer to come and get the experimenter. At that time, you (the experimenter) will explain more about the study, and answer any questions.
- (12) After the subject presses the "SPACE BAR", demonstrate the response procedure to him/her using the Blaupunkt car stereo example. Be sure to point out the following things:
 - (a) If the slide is not sharp, it can be focused with the knob on the top/left of the projector.
 - (b) The subject should read through each ad completely and look at any pictures before rating it on interest value. The subject should read the ad completely EVEN IF IT WAS SEEN AND READ ON SOME EARLIER OCCASION. One of the things we are interested in is how repetition influences the evaluation of advertisements.
 - (c) The cursor can be positioned anywhere along the scale; not just above the "+" marks.
- (13) If the subject has no questions, press the <SPACE BAR> and then go and find someplace to sit down for about 30 minutes.
- (14) The subject should come and get you when it's time to start the recall task.
- (15) First, check the tape-counter to see if sufficient tape is left for this subject. If not, then put in a new tape and reset the tape-counter to 000. Run the tape past the tape-leader.
- (16) Next, write the tape-counter position and your initials next to the subject's "Project ID Number" on the record-sheet for that cassette. Turn on the microphone.
- (17) Position the microphone in a spot directly in front of the subject. Then, move to the stall to the right of the computer and put the tape-recorder in the RECORD and PAUSE modes. Make sure the recorder is NOT in the play mode.

- (18) Be sure to mention the following things after the subject presses the <SPACE BAR> to set up the screen for the recall task.
 - (a) The subject should try to remember anything he/she can about the product. This includes anything about the picture or written material in the product's advertisement.
 - (b) The subject may only remember information for the first few seconds of the recall period. Yet, the subject should keep trying to recall information for the full two minute period, because some things that cannot be remembered immediately can be remembered after some thought.
- (19) Now, tell the subject to press the <SPACE BAR> when ready. When you hear the first beep, take the tape-recorder out of PAUSE mode to start recording. When you hear the second beep, put it back in PAUSE mode, and write down the new counter position.
- (20) When the subject has finished the two recall tasks, turn off the tape-recorder and microphone. Then, ask the subject to complete the few final questions on the computer display.
- (21) Finally, ask the subject to read the "Debriefing," and then answer his/her questions about the study.
- (22) Show the subject out of the lab room.

WHEN THE SUBJECT IS GONE . . .

- (23) Put the microphone back in its original position, and put the subject's materials on the far-left table face down.
- (24) If you are going to run another subject through the experiment, go to step (6).
- (25) If you are done running subjects, open the disk drive door, remove the disk, and return it to its cardboard sleeve. Turn off the computer and slide projector, and make sure the microphone is switched off.
- (26) Finally, turn off the light, and make sure the door is closed and locked.

Form 2 - Informed Consent Form

Subject's name _____

Subject's address _____

Project Number 82-26 Project Title Evaluation of copytesting techniques in advertising research.

Principal Investigator - Ray Burke Date

Purpose of the project and procedures to be followed:

The purpose of this project is to assess the reliability of a copytesting technique currently being used in advertising research. Students participating in this study will be seated in front of a slide projection screen and asked to look over a number of different advertisements presented sequentially on the projection screen. When an individual has finished reviewing the materials, he/she will be given the "Media Involvement Questionnaire", with general questions on magazine readership and TV viewing habits.

Risks and benefits:

There will be no risks associated with participation in this study. Students may benefit from participation by being exposed to a popular advertising copytesting technique. Further, participating students will receive one hour of experiment-participation credit. There will be no monetary compensation awarded.

I have read and I understand the procedure described above. I agree to participate in the procedure and I have received a copy of this description. I further agree that the information gained from this investigation may be used for educational purposes which may include publication. I understand that I may ask questions and withdraw my consent at any time without prejudice.

Signatures: _____
subject _____ date _____

witness _____ date _____

principal investigator date

Form 3 - Terminal Operation Instructions

INSTRUCTIONS

Over the next few minutes, you will be shown a number of different advertisements presented sequentially on the slide projection screen. Please look over each ad at your own pace. Take all the time you need to read through the written material completely and examine any accompanying illustrations. It is important that you read through the ad even if you have seen it on some earlier occasion.

When you have finished reading through the ad, you will be asked to indicate how interesting that ad was to you. Please respond by first moving a cursor (printed at the far left or right side of the screen) to the appropriate point above the interest rating scale. The cursor can be moved to the right by holding down the '/' key, and to the left by holding down the 'Z' key. Then, mark your answer by pressing the <SPACE BAR>. After you have marked your answer, the slide projector will automatically advance to the next advertisement. When you have finished reviewing and judging all of the ads, you will be asked to complete a printed questionnaire with general questions on magazine readership and TV viewing habits.

If a displayed advertisement is out of focus at any time, adjust the focus with the knob on the top/left of the projector.

Form 4 - Ad Review Instructions

Please look over this ad at your own pace. Take all the time you need to read through the written material completely and examine any accompanying illustrations. IT IS IMPORTANT THAT YOU READ THROUGH THE AD EVEN IF YOU HAVE SEEN IT ON SOME EARLIER OCCASION. DO NOT SKIP OVER ANY ADS.

If a displayed advertisement is out of focus at any time, adjust the focus with the knob on the top/left of the projector.

Form 5 - Media Involvement Questionnaire Instructions

* Thank you for reviewing and judging *
* each of the advertisements. *

Now, please look to the right of this computer terminal for a copy of the "Media Involvement Questionnaire." The purpose of this questionnaire is to gather information about your magazine readership and TV viewing habits, and to assess how you perceive, use, and respond to media communication. Please take all the time you need to answer each of its questions completely and accurately. When you have finished answering all of the questions, press the <SPACE BAR> on the terminal keyboard.

Please record your subject ID number in the upper-left-hand corner of this questionnaire.

Form 6 - Cued Recall Task Instructions

* Thank you for completing the *
* "Media Involvement Questionnaire" *

At this time, we would like you to answer a few questions about the products you saw advertised earlier. In just a few minutes, the name of one of these products will be printed on this display screen. The product name will be displayed for exactly 2 minutes. During this time, PLEASE TRY TO REMEMBER EVERYTHING YOU CAN ABOUT THE PRODUCT. You will be provided with a tape-recorder so that you can record any remembered information. During the 2 minute recall period, just say anything you can remember about the named product into the microphone of the recorder. It is not necessary for you to recall the exact words in the product's advertisement. The time you have remaining will be indicated by an hourglass printed on the left-hand side of this screen. When 2 minutes have elapsed, the product name will be erased.

At this time, please ask the experimenter to prepare the recording equipment.

Form 7 - Free Recall Task Instructions

Finally, we would like you to try to remember information about a whole class of products you might have seen in the earlier slide sequence (for example, car stereos). In just a few minutes, the name of a product class will be printed on this display screen. The name will be displayed for exactly 4 minutes. During this time, PLEASE TRY TO REMEMBER EVERYTHING YOU CAN ABOUT ANY PRODUCTS IN THIS PRODUCT CLASS THAT YOU SAW ADVERTISED EARLIER. Again, a tape recorder will be used to record any remembered information.

During the 4 minute recall period, just say anything you can remember about any of the products you saw earlier belonging to this product class. It is not necessary for you to recall the exact words in the product's advertisement, or even the name of the product. Just try to remember information about the advertised products.

Form 8 - Protocol Scoring Criteria

RECALL SCORING CRITERIA FOR IE3

Product Class - WatchesTarget - **Audemars Piguet Royal Oak Watch**

Product Characteristics	Execution Characteristics
A - The only way you are certain to spot the Royal Oak is to wear one.	A - Small Picture at top.
B - Master craftsmanship.	B - Cockpit of a plane.
C - Rare artistry, not commonplace.	C - Man and woman (embracing).
D - People who wear it appreciate gifted workmanship.	D - Both people are dressed in evening attire.
E - From Swiss Joux Valley.	E - Man is wearing white scarf.
F - Hand-polished parts and case.	F - Woman is wearing the watch.
G - Timed in five positions.	G - Beige/gold background.
H - Double sealed crown.	H - Man and woman's watch shown in bottom right corner.
I - Eight (hexagonal) bolts.	I - Dealers listed across bottom.
J - 18 karat gold.	
K - Immune to temperature variations.	
L - Water-resistant to 300 ft.	
M - Individually numbered.	
N - Once you see it, you'll want to see it again.	
O - Only worn on the privileged wrist.	
P - Octagonal watch face.	
Q - Brown face.	

Competition - **Movado LeCentenaire Watch**

Product Characteristics	Execution Characteristics
A - Water resistant to 100 ft.	A - (Black) cat pictured.
B - Stainless steel with gold-tone accents.	B - Animal has greenish eyes.
C - Accurate to within 60 seconds per year.	C - Fishbowl.
D - Since 1881.	D - Coral in fishbowl.
E - "Swiss Watchcraft"	E - Animal stares into fishbowl.
F - Square watch face.	F - (Two) watches in fishbowl.
G - Black face.	G - Black background.

Competition - Baume and Mercier Riviera Watch

Product Characteristics	Execution Characteristics
A - It will take you to the final square.	A - Black and white ad.
B - It is the perfect move.	B - (Large) chesspiece next to watches.
C - 12-sided case.	C - (Two) watches in middle.
D - Water resistant up to 99 feet.	D - One positioned vertically, and the other horizontally.
E - Made in Geneva.	E - Logo in upper-left corner.
F - White face.	

Competition - Rado Diastar Watch

Product Characteristics	Execution Characteristics
A - Styleproof. Unmistakably Rado.	A - Black and white ad.
B - Its style is synonomous with beauty.	B - White on top/Black on bottom.
C - A new perspective in time-pieces.	C - (One) watch in middle.
D - Signifies perfection in simplicity and clarity.	D - Watch lying on its side.
E - Square watch face.	E - Reflection of watch below.
F - White face.	
G - Scratchproof <u>case</u> .	
H - Will continue to look new.	

Product Class - Running ShoesTarget - **Mizuno Running Shoes**

Product Characteristics	Execution Characteristics
A - Still feel good 600 miles later.	A - Anyone can make shoes that feel good in the store.
B - Designed to age less.	B - Average shoe has 350 mile life.
C - Designed to wear better.	C - Picture centered on page.
D - Unique durable materials.	D - Person jogging.
E - Most technologically advanced design.	E - Early morning.
F - Exclusive RB midsole.	F - Dirt road.
G - Retains strength and resiliency.	G - Shadow in front of person.
H - Protects from injury.	H - Hills in background.
I - Heel counter of extra-firm leather board.	I - Four shoes displayed.
J - Carbon black compounded rubber outsole.	J - Bar chart.
K - 8 degree last in the sole (to guide foot).	K - Triathlon series emblem (bottom, left).
L - Not inexpensive (priced competitively).	
M - "M" on side of shoe.	

Competition - Avia Running Shoes

Product Characteristics	Execution Characteristics
A - Eight patents on shoe design.	A - Picture of balding man.
B - Cantilevered outsole.	B - Shown carving wood.
C - Winglike design.	C - Shoe workshop.
D - Kinetic ribs.	D - Shoe on table.
E - Eases foot and leg strain.	E - Pair of shoes hanging on wall.
F - Greater performance with less fatigue.	F - Foot running in rain.
G - Distinctive lightning bolt.	G - Cross-section of heel.
H - For basketball, raquetball, roadracing.	H - Compressed vs. noncompressed heel.
I - Innovative by design.	
J - Jerry Stubblefield is a . . . champion athlete.	
K - . . . Olympic Trials finalist.	
L - . . . university coach.	
M - . . . company president.	
N - . . . journeyman mold and pattern maker.	
O - He works hard and long.	
P - He knows biomechanics.	
Q - Think of him as the Leonardo of running.	

Competition - KangaROOS Comet Running Shoe

Product Characteristics	Execution Characteristics
A - Blister competition, not yourself!	A - Sneaker on (digital) scale (left).
B - Miller used shoe to win championship.	B - Cutaway view of shoe (top-center).
C - Miller didn't get a blister.	C - Shoe breaking (red) ribbon.
D - So light, its almost like running barefoot.	D - Shoe appears to be moving.
E - Weighs 186.5 grams (180-189).	E - Scott Miller running (right).
F - Rubber outsole.	F - Brown background.
G - High impact heel base.	G - Name across bottom edge of page.
H - Midsole with stability ledge.	
I - Genuine grain leather.	
J - (210 denier) nylon uppers.	
K - Padding cradles the foot.	
L - Padded pocket area and tongue.	
M - Slip-lasted construction.	
N - Notched heel.	
O - Protects Achilles tendon.	
P - World's only shoe with pockets.	
Q - (Blue) kangaroo on pocket.	

Competition - Tretorn Nylite Running Shoe

Product Characteristics	Execution Characteristics
A - There's really no other choice.	A - Shoe in red locker.
B - Terrycloth insole.	B - Next to towel.
C - Fully lined upper.	C - Next to tennis racket.
D - Microcellular rubber sole.	D - Next to (woman's) watch.
E - The ultimate tennis shoe.	E - Interior of locker is black.
F - (Blue) "U" stitched on side.	F - Tretorn name centered at bottom.

Product Class - Beer

Target - Grolsch Lager Beer

Product Characteristics	Execution Characteristics
A - 16 ounce bottle.	A - Man in background.
B - Perfect frame for a masterpiece.	B - (Open) window on left side.
C - Work of art.	C - Beer sitting on round table.
D - Frame (bottle) adds dimension.	D - Blue chair.
E - Frame enhances definition.	E - Antique room.
F - Frame heightens visual pleasure.	F - Sixpack at bottom of page.
G - Wire-top bottle.	G - Bottle standing beside six.
H - Bottle design 100 years old.	H - Black background.
I - Finest ingredients.	I - Grolsch name written in green (lower right).
J - Lagered for 3 months.	
K - Imported from Holland.	
L - Ingraving on bottle.	
M - Label on neck.	

Competition - Bohemia Beer

Product Characteristics	Execution Characteristics
A - Drinking it is time well spent.	A - Craftsman in background.
B - Must be tasted to be fully appreciated.	B - Carving violin.
C - Metaphorically compared to craftsman's work.	C - Wearing brown smock.
D - Brewed purely, meticulously, with no shortcuts.	D - He is old (bearded).
	E - Workshop setting.
	F - Dark brown background.
	G - Beer bottle and glass boxed off on left.
	H - Bohemia name covers bottom edge of page.

Competition - Kirin Beer

Product Characteristics	Execution Characteristics
A - Hard to find.	A - Drawing of yellow taxicab.
B - Similar to other hard-to-find things.	B - Two green theater tickets.
C - Largest selling beer outside America.	C - Red alarm clock.
D - Worth the effort to find it.	D - Lawyer who speaks English.
E - Brewed in Japan.	E - Stars over Manhattan.
F - Dragon on bottle.	F - Dietetic Pizza.
	G - City block without gourmet shop.
	H - Doctor who makes apartment calls.
	I - Psychiatrist who doesn't need one.
	J - Cool breeze in August.
	K - Croissants for under 60 cents.
	L - Extra hour of sleep.
	M - Short movie line.
	N - Unobstructed view of Manhattan sunrise.
	O - Accurate weather forecast.
	P - Excuse for not jogging.
	Q - Airconditioned bus.
	R - Seventh row center at Broadway show.

Competition - **Kalback Lager Beer**

Product Characteristics	Execution Characteristics
A - Winner of the Swedish No-Belly Prize.	A - Picture on bottom.
B - The Swedish brewing secret.	B - Bottle against white background.
C - Brewed in Sweden.	C - Green background at top.
D - 12 ounce bottle.	
E - Green bottle.	
F - (Red) crown on bottle.	

Product Class - Automobiles

Target - Lada Automobile

Product Characteristics	Execution Characteristics
A - \$4698 (4600-4800 or "under \$5000").	A - Red lettering.
B - No car comes with so much and goes for so little.	B - Blank and white ad.
C - 83 hp. (80-90).	C - One person in car.
D - 4 cylinder.	D - Car on dirt road.
E - Power assisted brakes (10" front disks).	E - Full front view of car.
F - Reclining bucket seats.	F - Grainy photograph.
G - Velour upholstery.	
H - Retractable armrest.	
I - Tachometer.	
J - Electric clock.	
K - 10.7 cu. ft. trunk (large trunk).	
L - Manual Choke.	
M - Rear window defroster.	
N - Full carpeting.	
O - Steel body.	
P - Safety lights in door.	
Q - Rustproof guarantee.	
R - Price is negotiable.	
S - Canadian car.	
T - Box shaped.	

Competition - **Rover 3500SE Automobile**

Product Characteristics	Execution Characteristics
A - Formula for success.	A - (Driver) side view.
B - 155 bhp. (150-160).	B - (Orange) running light visible.
C - 8 cylinder.	C - No passengers.
D - Electronic ignition.	D - Car photo exceeds ad space.
E - (Automatic) air temperature control.	E - Black road surface.
F - Aerodynamic (bodyshell).	
G - Crosswind stability.	
H - Self-leveling rear suspension.	
I - Top speed of 126 mph. (120-130).	
J - 0-60 in 8.6 seconds (8.0-9.0).	
K - Cruising economy of 36.3 mpg (36.0-37.0).	
L - Success breeds success.	
M - Green car.	
N - Cream colored interior.	

Competition - Honda Quintet Automobile

Product Characteristics	Execution Characteristics
A - You may have to pull a few strings to get one.	A - (Passenger) side view.
B - 1602 cc (1600-1700).	B - Picture of car at top of page.
C - 5 door hatchback.	C - Black on white copy.
D - Electrically operated sun-roof.	D - Car against black background.
E - Dual waveband radio.	
F - (Hydraulic) headlamp height adjusters.	
G - Tailgate release.	
H - Visual warning system (13 functions).	
I - Display indicates unlocked doors.	
J - Reputation for reliability.	
K - Admired by everybody.	
L - Brown car.	
M - Gold interior.	

Competition - Suzuki SJ410 Automobile

Product Characteristics	Execution Characteristics
A - Practicality has its rewards.	A - Urban street scene.
B - Great fun on a tight budget.	B - 4 passengers (2 men, 2 women).
C - 4-wheel drive.	C - Restaurant in background.
D - Room for 4 adults.	D - (Passenger) side view.
E - Smooth comfortable ride.	E - Car pictured at top of ad.
F - Not a cheap car.	F - Black on white copy.
G - At home in the city, country, beach or the bush.	G - 2 small pictures of car models (bottom, right side).
H - Operates well on hills, in snow, gravel or gumbo.	
I - Hardtop and pickup available.	
J - Red car (with stripes).	
K - White spoke wheels.	
L - Open roof.	
M - Red car (with stripes).	
N - Extra tire on back of car.	

APPENDIX D
COMPUTER CONTROL PROGRAM--STUDY 3

Computer Control Program - Study 3

```
( Interference Experiment 3 - Load Block )
?DEF [] NOT IF GRAPHICS /LOAD THEN
01 LOAD 02 LOAD 03 LOAD 04 LOAD 05 LOAD 06 LOAD 07 LOAD 08 LOAD
;S
```

```
( Interference Experiment 3 - Block 1 )
FILE 1INSTRUCT DK0:IE3IN1.TXT FILE 2INSTRUCT DK0:IE3IN2.TXT
FILE 3INSTRUCT DK0:IE3IN3.TXT FILE 4INSTRUCT DK0:IE3IN4.TXT
FILE 5INSTRUCT DK0:IE3IN5.TXT FILE RWDATA DK0:RWDATA.TXT
22 CONSTANT #SLIDES
0 INTEGER SNUM 0 INTEGER PCLASS #SLIDES DIM REVWTIME
0 INTEGER REPLEVEL 0 INTEGER COMLEVEL #SLIDES DIM ADINTRST
10 V*DIM PRODUCT 11 V*DIM CLASS 8 DIM MRESP
0 V*DIM DATA 12 V*DIM MCHECK
0, 2INTEGER HOLDTIME
: T-START ( Begin Timing ) T-GET HOLDTIME 2! ;
: T-STOP ( -> ElapsedTime ) T-GET HOLDTIME 2@ D- DROP ;
: @+ ( Address String -> NewString ) @ B>S @CAT ;
: @F+ ( Address Field String -> NewString ) SWAP @ SWAP
B>FS @CAT ;
;S
```

```
( IE3 - 2 )
RANDOMIZE 10 CONSTANT SCLROW
: QINSTR $↑UP 21 0 $↑POS $↑CS ." Press 'Z' to" 21 30 $↑POS
." Press <SPACE BAR>" 21 64 $↑POS ." Press '?' to"
22 1 $↑POS ." move cursor left" 22 32 $↑POS
." to mark answer" 22 62 $↑POS ." move cursor right"
23 6 $↑POS ." <----" 23 68 $↑POS ." ---->" $↑LOW ;
: SCALE SCLROW 19 $↑POS 9 1 DO ." +----" LOOP ." +";
: QUESTION ( Line1 Line2 Lbls1 Lbls2 -> ) @DUP ?BLANK IF @DROP
ELSE SCLROW 2+ 14 $↑POS @. THEN SCLROW 1+ 14 $↑POS
@. @DUP ?BLANK IF @DROP ELSE SCLROW 3 - 0 $↑POS 80
@CE @. THEN SCLROW 4 - 0 $↑POS 80 @CE @. ;
;S
```

```
( IE3 - 3 )
: GETRESP 0 1 RND 79 * 19 - $†CON BEGIN SCLROW 1- OVER 19 +
$†POS TT> CASE 32 [[ DUP DUP 0< SWAP 40 > OR IF CLICK
0 ELSE 1 THEN ]] 47 [[ DUP 60 < IF 1+ ELSE CLICK
THEN 0 ]] 122 [[ DUP -19 > IF 1- ELSE CLICK THEN 0 ]]
ELSE[[ BELL 0 ]] ENDCASE END $†COFF SCLROW OVER 19
+ $†POS 88 >TT 120 T-WAIT ;
: ASK $†BLANK DISABLE KEYINT QINSTR SCALE QUESTION
$†UNBLANK GETRESP ENABLE KEYINT ;
;S
```

```
( IE3 - 4 )
0 INTEGER .FLAG
25 CONSTANT YOFF 5 CONSTANT XOFF 0 INTEGER .LEVEL
: GLASS 121 0 DO YOFF XOFF I + []SET YOFF 120 + XOFF I +
[]SET YOFF I + XOFF I + []SET YOFF 120 + I - XOFF I +
[]SET LOOP ;
: LABELS ( MaxTime -> ) 0 25 $†POS ." Seconds Remaining"
2 33 $†POS DUP 3 .R CR 4 33 $†POS 2* 3 / DUP 3 .R CR
6 33 $†POS 2/ 3 .R CR 8 33 $†POS ." 0" ;
: SANDLINE 120 .LEVEL @ - 60 DO YOFF I + XOFF 60 + .FLAG @ DUP
NOT .FLAG ! 1 AND IF []SET ELSE []RST THEN LOOP ;
: LOSESAND .LEVEL DUP 1+! @ DUP DUP 119 SWAP - SWAP 2+ DO DUP
YOFF + XOFF I + []RST DUP 120 SWAP - YOFF + XOFF I +
[]SET LOOP DROP ;
;S
```

```
( IE3 - 5 )
: SNDRST .LEVEL 0SET 60 1 DO 119 I - I 2+ DO J YOFF + XOFF I +
[]SET LOOP LOOP ;
: SETGLASS ( MaxTime -> ) $[]†BLANK $†CLR [] []CLR GLASS SNDRST
LABELS $[]†UNBL ;
: PASSTIME ( Time -> ) BELL 19 * 20 / 59 1 DO SANDLINE DUP
T-WAIT LOSESAND LOOP DROP BELL ;
: GETPARMS ." Enter subject number - " SNUM #INPUT! CR
." Enter product class number - " PCLASS #INPUT! CR
." Enter repetition level - " REPLEVEL #INPUT! CR
." Enter competition level - " COMLEVEL #INPUT! CR ;
;S
```

```

( IE3 - 6 )
: CATDATA @NULL SNUM 3 @F+ BLANK @CAT PCLASS @+ REPLEVEL @+
  COMLEVEL @+ 9 1 DO I MRESP 3 @F+ LOOP
  @NULL #SLIDES 1+ 2 DO I REVWTIME @ 60 / 3 B>FS @CAT
  LOOP @NULL #SLIDES 1+ 2 DO I ADINTRST 3 @F+ LOOP ;
: SAVDATA SPU? CHANNEL @ RWDATA DISK SNUM @ 1- 4 * 1+ DATA
  DUP 2+ UNHOLD FLUSH DISK ;
: SLIDESHOW NEWSLIDE DISABLE KEYINT $+BLANK 2INSTRUCT $+FSHOW
  " Compared to most ads you are familiar with,"
  " how interesting was this ad?"
  "          Very          Average          Very"
  " Uninteresting          Interesting"
  QUESTION QINSTR $+UNBLANK #SLIDES 1+ 1 DO T-START
  SCALE GETRESP I ADINTRST ! T-STOP I REVWTIME !
  NEWSLIDE LOOP ENABLE KEYINT ;
;S

( IE3 - 7 )
: SETQUES 17 16 $+POS ." Please try to remember everything "
  ." you can about" 19 16 $+POS 47 0 DO 95 >TT LOOP ;
: PPROMPT PCLASS @ PRODUCT @LINE 80 @CE 18 0 $+POS @. ;
: CPROMPT PCLASS @ CLASS @LINE 80 @CE 18 0 $+POS @. ;
: PASK PCLASS @ PRODUCT @LINE " ?" @CAT 80 @CE SCLROW 3 -
  0 $+POS @. ;
: LASTQUES DISABLE KEYINT 9 1 DO I DUP 4 = OVER 7 = OR IF
  NEWSLIDE THEN 1- 4 * 1+ MCHECK DUP 3 + HOLD $+CLR
  I 4 < IF $+BLANK PASK THEN ASK I MRESP ! LOOP ;
: TDISPLAY #SLIDES 1+ 1 DO I 2 .R SPACE I REVWTIME @ 60 / 3 .R
  I ADINTRST @ 3 .R CR LOOP ;
;S

( IE3 - 8 )
: STUDY $+COFF $+CLR GETPARMS RANDOMIZE LINSTRUCT
  " Press <SPACE BAR> when ready to review first ad"
  $+PFSHOW 32 KEY-WAIT SLIDESHOW 3INSTRUCT
  " Press <SPACE BAR> after completing questionnaire"
  $+PFSHOW 32 KEY-WAIT 4INSTRUCT
  " STOP - Please get the experimenter at this time"
  $+PFSHOW 32 KEY-WAIT 120 SETGLASS SETQUES
  " Press <SPACE BAR> when ready" $+PROMPT 32 KEY-WAIT
  PPROMPT 120 PASSTIME 120 T-WAIT []BLANK 5INSTRUCT
  " Press <SPACE BAR> to continue" $+PFSHOW 32 KEY-WAIT
  240 SETGLASS SETQUES " Press <SPACE BAR> when ready"
  $+PROMPT 32 KEY-WAIT CPROMPT 240 PASSTIME 120 T-WAIT
  []BLANK $+CLR LASTQUES $+CLR CATDATA SAVDATA TDISPLAY
  $+CON ;
;S

```

(Block 10 - List of Target Products)

the Audemars Piguet Royal Oak watch
the Mizuno running shoe
Grolsch Lager beer
the Lada automobile

(Block 11 - List of Product Classes)

any watches you saw advertised
any running shoes you saw advertised
any brands of beer you saw advertised
any automobiles you saw advertised

(Block 12 - Manipulation Check Questions)

How interesting or uninteresting was the ad for

Very Uninteresting	Average	Very Interesting
-----------------------	---------	---------------------

How much do you like or dislike

Dislike Very Much	Neutral	Like Very Much
----------------------	---------	-------------------

How likely or unlikely would you be to purchase

Very Unlikely	50/50 Chance	Very Likely
------------------	-----------------	----------------

How familiar or unfamiliar are you with this particular advertisement at the present moment?

Very Unfamiliar	Very Familiar
--------------------	------------------

How familiar or unfamiliar were you with this particular advertisement before seeing it in this study?

Very Unfamiliar	Very Familiar
--------------------	------------------

How familiar or unfamiliar were you with this particular BRAND OF PRODUCT before seeing it in this study?

Very Unfamiliar	Very Familiar
--------------------	------------------

While you were looking at the ads, did you expect that you would be asked to recall the information at some later time?

Did Not Expect	Very Much Expected
-------------------	-----------------------

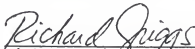
While you were looking at the ads, did you try to memorize the information in preparation for a recall test?

Did Not Try To Memorize	Tried Hard To Memorize
----------------------------	---------------------------

BIOGRAPHICAL SKETCH

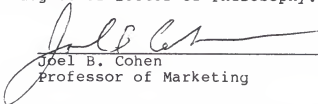
Raymond Robert Burke was born on October 24, 1956, in Collingdale, Pennsylvania. He was awarded the degree of Bachelor of Arts in psychology and communications from the University of Miami in 1977, and the Master of Science degree in psychology from the University of Florida in 1981. He married Harriet Anne High in June of 1982, and currently serves as an instructor at the Wharton School (Marketing Department) of the University of Pennsylvania. His area of emphasis is consumer psychology.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



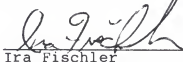
Richard Griggs, Chairman
Associate Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



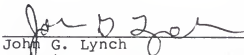
Joel B. Cohen
Professor of Marketing

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Ira Fischler
Associate Professor of Psychology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



John G. Lynch
Associate Professor of Marketing

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Patricia Miller
Associate Professor of Psychology

This dissertation was submitted to the Graduate Faculty of the Department of Psychology in the College of Liberal Arts and Sciences and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May 1985

Dean for Graduate Studies and
Research